DOCUMENT RESUME

ED 203 172 CE 029 338

AUTHOR	Uthe, Elaine F.
TITLE	Assessment of Vocational Aptitudes for the Handicapped.
INSTITUTION	Kentucky State Dept. of Education, Frankfort. Bureau of Vocational Education.; Kentucky Univ., Lexington. Div. of Vocational Education.
PUB DATE	Jun 80
NOTE	145p.; Some appendix pages will not reproduce well due to small print.
EDRS PRICE	MF01/PC06 Plus Postage.
DESCRIPTORS	*Aptitude Tests; Career Guidance; Competence; *Disabilities; *Exceptional Persons; Individualized Education Programs; Inservice Teacher Education; Job Analysis; Mainstreaming; *Models; Preservice Teacher Education; Secondary Education; Special Education; Student Attitudes; Student Characteristics; *Student Evaluation; Teacher Attitudes; *Vocational Aptitude; Vocational Education
IDENTIFIERS	Kentucky

ABSTRACT

The overall objective of this study was to assist vocational teachers and administrators in assessing the vocational aptitudes of handicapped students by conceptualizing a model. Various parts of the model included identification of diagnostic tools and measures, the job matching process, and the development of the Individual Education Program. Teacher competencies needed to use the model effectively were categorized in four areas: vocational aptitude assessment, job analysis, instructional design, and attitudes. The study was carried out by interviewing vocational educators, evaluation lab directors, university faculty, special educators, and vocational directors in Kentucky. Site visitations to existing evaluation labs were made, and a visit to the National Center for Research in Vocational Education was made to interview specialists and review current research materials. Some parts of the model and other data were developed from and used in a vocational education seminar on "mainstreaming" held with vocational teachers. The conceptualized model provides a basis for the local schools to build an effective vocational aptitude assessment system for working with its handicapped students. It also provides suggestions for preservice and inservice preparation of vocational teachers. (Author/KC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED205172

ASSESSMENT OF VOCATIONAL APTITUDES FOR THE HANDICAPPED

by

Elaine F. Uthe
Department of Vocational Education
University of Kentucky

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

J. D. Ellis

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

June, 1980

Project Number V288HR013F	KENTUCKY
A cooperative effort between the University of Kentucky and the Kentucky Bureau of Vocational Education, Research Coordinating Unit	DEPARTMENT OF EDUCATION Raymond H. Barber Superintendent

The University of Kentucky College of Education is an equal opportunity employer authorized to provide research, educational information, and other services to individuals and institutions that function without regard to race, color, sex, age, handicap, marital status, or national origin.

The content in this report does not necessarily represent that of the College of Education, University of Kentucky, or the Bureau of Vocational Education, Kentucky State Department of Education.

ACKNOWLEDGEMENTS

A special note of appreciation goes to the staff at the Eastern Kentucky Comprehensive Rehabilitation Center; Lyndon Vocational School, Louisville; Fayette County Special Education Department, University of Kentucky, and the Bureau of Vocational Education for their assistance and support in preparing this report.

A special note of appreciation is also given to those graduates students in a seminar on "mainstreaming" in vocational education for their input and reactions to the ideas expressed in this report.

Elaine F. Uthe

Elaine F. Uthe
Project Director

PROJECT ABSTRACT

Title: ASSESSMENT OF VOCATIONAL APTITUDES FOR THE HANDICAPPED

Duration: July 1, 1979, to June 30, 1980

Objectives: The overall objective was to assist vocational teachers and administrators in assessing the vocational aptitudes of the handicapped by conceptualizing a model. Various parts of the model were then discussed in detail: identification of diagnostic tools and measures, the job matching process, and the development of the Individual Education Program.

Teacher competencies needed to effectively utilize the model were categorized in four areas: (1) vocational aptitude assessment; (2) job analysis; (3) instructional design; and (4) attitudes.

Procedures: Channeled interviews with vocational educators, evaluation lab directors, university faculty, special educators, and vocational directors were held in various parts of Kentucky.

Site visitations to existing evaluation labs were made, and a visit to the National Center for Research in Vocational Education was made to interview specialists and review current research materials.

Some parts of the model and other data were developed from and utilized in a vocational education seminar on "mainstreaming" held with vocational teachers.

Contribution to Education: This conceptualized model provides a basis for the local school(s) to build an effective vocational aptitude assessment system for working with its handicapped students. It also provides suggestions for pre-service and in-service preparation of vocational teachers.

The conceptualized model will be useful only if it is implemented with thoughtful consideration in the local school, however. Teacher education in-service must also be provided.

Products: This report is the major product of this project.

TABLE OF CONTENTS

Chapter Page

LIST OF FIGURES

Chapter

1 INTRODUCTION 1

Purpose of This Report 2

Need For This Report 2

Limitations 3

The IEP Process 3

The Handicapped 5

Vocational Aptitudes of the Handicapped . . 6

Other Basic Considerations 7
Program Accommodations and Curriculum Modifications 7
Faculty Development 9
Diagnosis and Assessment System 10
Management and Reporting System 10

Summary 11

2 THE VOCATIONAL APTITUDE ASSESSMENT MODEL . . . 12

Sites for Vocational Assessment 13

Components for a Vocational Aptitude Assessment Process 14

Principles Underlying Vocational Assessment 15

Objectives of Vocational Aptitude Assessment 16

The Generalized Vocational Aptitude Assessment Model 17

Time-Line Process for the Vocational Aptitude Assessment Model 19

apter Page

Other Models 19

Summary 21

3 DIAGNOSTIC TOOLS AND MEASURES 22

Steps in the Vocational Aptitude Assessment Process 22
Pre-Assessment 22
Test Administration 24
Analysis and Interpretation 24
IEP Development 25
Re-Evaluation 25

Guidelines for Selecting Diagnostic Tools and Measures 25

What Vocational Educators Need to Know . . 27
Medical and Physical Assessments 27
Work/Living Skills Assessment 29
Psychological Assessment 30
Educational Assessment 32
Vocational Interest and Preference Assessment 33

Names of Diagnostic Tools and Measures . . 34
Educational Assessment 34
Physical Assessment 35
Vocational Aptitude Tests 36
Work Sample Assessments 37

Summary 38

4 THE JOB MATCHING PROCESS 40

The DICTIONARY OF OCCUPATIONAL TITLE Approach 41

Preparation of the DOT Summarization Sheet. 42

The Job Match Process 44

Development of the IEP 48

Summary 51

5 TEACHER COMPETENCIES 52

Competencies 54

Summary 55

Chapter Page

6 SUMMARY AND RECOMMENDATIONS 57

Recommendations 58

Implications 59

ANNOTATED BIBLIOGRAPHY 60

APPENDIX

A SAMPLE IEP FORMS (FAYETTE COUNTY) 78

B CETA PROGRAM INTAKE AND ASSESSMENT MODEL . . . 80

C MODIFICATION PROCESS MODEL BY WISCONSIN VOCATIONAL STUDIES CENTER 82

D MARYLAND FLOWCHART OF VOCATIONAL EVALUATION ACTIVITIES 84

E ASSESSING STUDENT NEEDS IN COLORADO 85

F GOODWILL INDUSTRIES OF SOUTH FLORIDA, INC. . . 86

G PUBLISHERS OF PAPER-AND-PENCIL VOCATIONAL APTITUDE TESTS 89

H PUBLISHERS OF WORK SAMPLE TESTS AND/OR SYSTEMS 92

I PARTS OF DOT OCCUPATIONAL DEFINITION 115

J EXPLANATION OF DATA, PEOPLE AND THINGS (DOT) . 123

K EXPLANATION OF WORKER TRAITS COMPONENTS (DOT) 126

L GENERAL EDUCATIONAL DEVELOPMENT (DOT). 130

LIST OF FIGURES

No.		Page
1	IEP PROCESS MODEL	4
2	COMPONENTS OF A VOCATIONAL EDUCATION MODEL FOR HANDICAPPED STUDENTS	8
3	A GENERALIZED VOCATIONAL APTITUDE ASSESSMENT MODEL FOR HANDICAPPED	18
4	TIME-LINE MODEL FOR VOCATIONAL APTITUDE ASSESSMENT MODEL	20
5	STAGES OF THE VOCATIONAL APTITUDE ASSESSMENT PROCESS	23
6	CHECKLIST FOR RATING VOCATIONAL APTITUDE DIAGNOSTIC TOOLS	28
7	DOT SUMMARIZATION FORM	42
8	DOT SUMMARIZATION FORM: WELDING	46
9	DOT SUMMARIZATION FORM: CLERK-TYPIST	47
10	JOB/TASK ANALYSIS APPROACH TO DEVELOPMENT OF IEP FOR VOCATIONAL EDUCATION	50
11	MATRIX APPROACH TO PROFESSIONAL DEVELOPMENT COURSE ON PROGRAM MODIFICATION AND PRESCRIPTIVE TEACHING FOR HANDICAPPED STUDENTS	53

CHAPTER 1

INTRODUCTION

Each person has an unique and complex combination of needs, interests, and abilities. Physiological and psychological factors influence the individual's capability of developing and using these innate characteristics.

Education's role in society is the enhancement of the individual's self-development by providing opportunities and assistance to learn basic skills (reading, writing, and arithmetic), acquire advanced skills, acquire occupational skills, develop recreational and leisure abilities, and develop personal/group relationships.

Vocational education, as one part of the education spectrum, prepares individuals to enter the labor market with occupational skills.

Public Law 94-142 Education for All Handicapped Children mandates a free and appropriate education, including vocational education, for all handicapped children. This piece of legislation thus combines the objectives and services of several areas within education and focuses their attention on a specific segment of the population--the handicapped student.

The process of determining an appropriate program in the vocational area (as well as in other areas) for an individual with one or more mental or physical handicaps of varying degrees of severity is complex and time consuming but extremely important. The approach must be well planned and well organized if it is to be effective.

PURPOSE OF THIS REPORT

This report is designed to assist the vocational counselor and the vocational teacher in planning and operating a vocational planning system for handicapped students. A model for making full use of vocational aptitudes of the handicapped student in selecting and planning vocational will be proposed. The model will be supported by descriptive materials for designing procedures for the local school to use in developing its own system.

The model will include three major segments:

(1) the identification of diagnostic tools/measures for assessing the vocational aptitudes of the handicapped;

(2) a schema for developing the IEP as it involves vocational training; and

(3) the identification of competencies needed by vocational teachers for working with handicapped students in planning vocational training.

NEED FOR THIS REPORT

This report attempts to develop a model that will aid vocational educators in providing appropriate, effective vocational training for handicapped students. Legislation mandates the enrollment of the handicapped in the least restrictive environment possible and in appropriate vocational programs--the "mainstreaming" concept, simply stated.

This model may be used by local schools, vocational planners, teacher education institutions, and in-service directors; adjustments may be necessary in order to fit specific situations and purposes. At the present time, some schools have developed procedures, and there is a need to share information and experiences with others. Other schools have developed only one part of the process. This model will aid vocational planners in developing systematic programs for (a) assessing the vocational aptitudes of handicapped children and (b) developing appropriate Individual Education Programs for them.

LIMITATIONS

This report and its model will concentrate on only one phase of the IEP (Individual Education Program) development--namely, the acquisition of vocational aptitudes assessments and their use in the IEP plans.

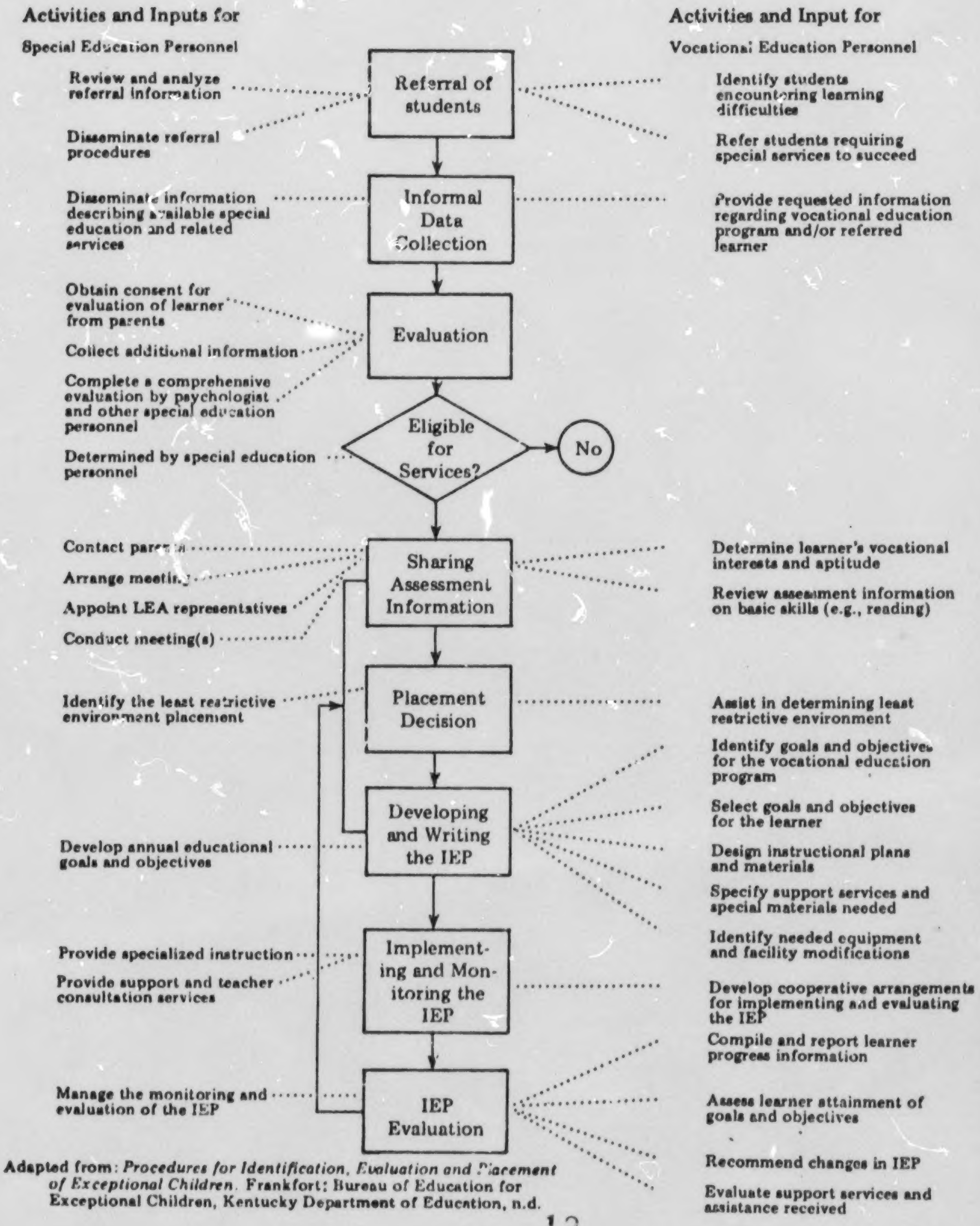
THE IEP PROCESS

Public Law 94-142 mandates that all handicapped students be identified and then mainstreamed into an appropriate educational and vocational program in the least restrictive environment possible. Schools need to develop specific processes and procedures for providing these services while maintaining the rights and privileges of the student--under due process of the law.

One example of such a process, often referred to as the "IEP Process," is given in Figure 1. This process model illustrates the activities and inputs from two professional groups--the special education personnel and the vocational education personnel.

The role of the vocational teacher is very important to the IEP process; and in many schools, the full participation of the vocational teacher has not taken place.

FIGURE 1. IEP PROCESS MODEL


Activities and Inputs for
Special Education Personnel
Activities and Input for
Vocational Education Personnel
Review and analyze referral information
Disseminate referral procedures
Referral of students
Identify students encountering learning difficulties
Refer students requiring special services to succeed
Disseminate information describing available special education and related services
Informal Data Collection
Provide requested information regarding vocational education program and/or referred learner
Obtain consent for evaluation of learner from parents
Collect additional information
Complete a comprehensive evaluation by psychologist and other special education personnel
Evaluation
Determined by special education personnel
Eligible for Services?
No
Contact parents
Arrange meeting
Appoint LEA representatives
Conduct meeting(s)
Sharing Assessment Information
Determine learner's vocational interests and aptitude
Review assessment information on basic skills (e.g., reading)
Identify the least restrictive environment placement
Placement Decision
Assist in determining least restrictive environment
Identify goals and objectives for the vocational education program
Develop annual educational goals and objectives
Developing and Writing the IEP
Select goals and objectives for the learner
Design instructional plans and materials
Specify support services and special materials needed
Identify needed equipment and facility modifications
Provide specialized instruction
Provide support and teacher consultation services
Implementing and Monitoring the IEP
Develop cooperative arrangements for implementing and evaluating the IEP
Compile and report learner progress information
Manage the monitoring and evaluation of the IEP
IEP Evaluation
Assess learner attainment of goals and objectives
Recommend changes in IEP
Evaluate support services and assistance received

Adapted from: *Procedures for Identification, Evaluation and Placement of Exceptional Children*. Frankfort: Bureau of Education for Exceptional Children, Kentucky Department of Education, n.d.

THE HANDICAPPED

As defined in Public Law 94-142, the handicapped student is one who is evaluated as (a) being mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, orthopedically impaired, deaf-blind, and/or having other health impairments, multi-handicaps, or specific learning disabilities; and (b) who because of these impairments need special education and related services.

If a student has some type of impairment but does not need special education, the student is not considered "handicapped" and therefore is not eligible for related services. Handicaps do vary in severity--from slight to moderate to severe levels. Some individuals overcome slight problems and are not in need of, nor eligible for, special education and related services. Burnette stated that the terms "impaired," "disabled," and "handicapped" should not be used interchangeably. She defined them as:

> Impaired individuals have identifiable organic or functional conditions; some part of the body is actually missing, a portion of an anatomical structure is gone, or one or more parts of the body do not function adequately. The condition may be permanent, as in the case of amputation, congenital birth defect, cerebral palsy, brain damage, or rectolinial fibroplasia. It may be temporary--functional speech defects, some learning disabilities, various emotional problems, certain social maladjustments, or specific movement deficiencies.
>
> Disabled individuals, because of impairments, are limited or restricted in executing some skills, doing specific jobs or tasks, or performing certain activities. Individuals with certain impairments should not be automatically excluded from activities because the condition makes it appear that they cannot participate safely, successfully, or with personal satisfaction. Some impaired persons attain high levels of excellence in activities in which they are not supposed to be able to perform or participate; is this success in spite or because of us?

> Handicapped individuals, because of impairment or disability, are adversely affected psychologically, emotionally, or socially. Handicapped persons reflect an attitude of self-pity. Some individuals with impairments and disabilities are handicapped, some severely. Others with severe impairments or disabilities adjust extremely well to their conditions and live happy and productive lives. In their eyes they are not handicapped even though society continues to label them handicapped. Undoubtedly many persons in society with either impairment or disability are handicapped.[1]

VOCATIONAL APTITUDES OF THE HANDICAPPED

The placement of handicapped students in vocational programs should be an orderly, comprehensive process based on assessments of vocational aptitudes and interests as well as physical and mental capabilities. Appropriate diagnostic tools should be used with any necessary accommodations made for the individual's handicap--i.e., reading a printed test to a blind person.

The assessment determines what the handicapped individual can do, wants to do, and has the potential to do. The assessment is not a screening process; it is the first step in matching abilities, interests, and aptitudes with potential jobs and careers.

The diagnoses made during the assessment and evaluation process aid in determining an appropriate vocational program, designing the Individual Education Program (IEP), providing instruction, identifying curriculum accommodations and related services, and making periodic evaluations.

The IEP includes assessment and diagnostic data and the subsequent identification of the vocational program, statements of competencies and/or performance objectives to be achieved, time the service is to begin, the evaluation plan, and support or related services needed. Needless to say, the IEP is an extremely important document in the educational life of the handicapped student.

---

[1] Burnette, Wanda L. "Who handicaps the Handicapped?" American Correctional Therapy Journal, May-June, 1974, p. 72.

OTHER BASIC CONSIDERATIONS

The assessment of handicapped students represents only one facet of the "mainstreaming" process; other considerations include accessibility of building and facilities, program accommodations and curriculum modifications, faculty development, selection of appropriate instructional techniques and materials, and management and reporting systems essential for program reviews and followup activities. (See Figure 2.)

Accessibility of Building and Facilities. Buildings, classrooms, public restrooms, and cafeterias must be accessible to all handicapped and nonhandicapped students. Ramps and elevators may be necessary. Such changes as lowered water fountains and public telephones are needed for wheelchair students. Large room numbers and signs at eye level (rather than above the door) are helpful for the visually impaired. School administrators should check state and federal building codes and regulations for precise regulations related to architecture.

Classrooms must be accessible, particularly doors and aisles, with ample maneuvering space for individuals in wheelchairs. Safety procedures, especially during fire drills, must be considered.

Program Accommodations and Curriculum Modifications. Vocational personnel should make plans that (a) provide special and/or innovative programs for handicapped persons and (b) facilitate curriculum modifications.

FIGURE 2

COMPONENTS OF A VOCATIONAL EDUCATION MODEL FOR HANDICAPPED STUDENTS

Accessibility of Building/ Facilities	Program Accommodations/ Modifications	Faculty Development System	Diagnosis/ Assessment System	Instruction	Management and Reporting System
Entrance	Mainstreaming	Attitudes	Diagnosis	Competencies	Accountability Reports
Classrooms	Special Program	Instructional Design	Assessment	Methods/ Techniques	Compliance Reports
Restrooms		IEP Development	Support Services	Materials	System Evaluation
Cafeteria		Evaluation	Review	Equipment Adaptation	Program Evaluation
				Support Services	Student Follow-Up

While curriculum modifications and/or accommodations for the handicapped student cannot be made until that person is identified and the handicap known, vocational planners and teachers should structure all vocational courses to facilitate such action. For example, there should be a course syllabus for every vocational course.

This course syllabus should list competencies in behavioral terms; that is, name the conditions under which competencies are to be demonstrated, make known the criteria standards and type of evaluation, and give the estimated amount of time needed to master the competency. These competencies can then be matched on a matrix with abilities, aptitudes, past achievements, physical capacities, and basic skills when developing the IEP.

Furthermore, special and/or innovative vocational programs may be needed if the handicapped students cannot succeed in the regular vocational program. Such innovative vocational programs should be based on needs projected from school census figures, special education enrollments, job opportunities cited by the state and federal Bureau of Labor Statistics, and occupational opportunity studies such as the on entitled OCCUPATIONAL OPPORTUNITIES FOR THE PHYSICALLY HANDICAPPED.[2]

Faculty Development. Vocational planners, counselors, and teachers need professional training specifically designed and of sufficient duration to develop competencies for working with the handicapped. At a minimum, faculty development should occur in the areas of (a) development of comprehensive syllabi; (b) awareness and understanding of various types of handicaps; (c) writing of competency statements and/or performance objectives; (d) principles of modifying/accommodating the curriculum for specific types of handicaps, principles for adjusting teaching techniques and methods; (e) selection of and/or developing instructional materials and learning modes; (f) and knowledge of evaluation tools and techniques for working with the handicapped.

---

[2] Uthe, Elaine F. OCCUPATIONAL OPPORTUNITIES FOR THE PHYSICALLY HANDICAPPED, a cooperative effort between the University of Kentucky and the Research Coordinating Unit, Bureau of Vocational Education, Kentucky State Department of Education, 1980.

Diagnosis and Assessment System. A comprehensive diagnostic and assessment system should be developed to help vocational planners, teachers, counselors, and special education teachers provide an appropriate vocational program for the handicapped student. A policy and procedures handbook should be developed and distributed to vocational planners, parents, teachers, and in some cases, students.

Management and Reporting System. The vocational program should have a self-adjusting management system to maintain balance and meet changes. Hence, it is important that data be recorded in a systematic way for several purposes: (a) improvement of program, (b) evaluation of students and (c) accountability reports for compliance with the law.

The management system should include objectives, procedures, and evaluation checkpoints. A guidance process should be employed to aid in matching handicapped students with specific jobs/careers and programs.

Periodic evaluation of the management system and the vocational programs should be built into the system. Records should be maintained of students' successes and failures to provide data for making improvements.

SUMMARY

This report describes a model for diagnosing the vocational aptitudes of handicapped students. The model includes discussion for using the vocational aptitudes assessment with job matching processes to develop the IEP. The competencies needed by vocational teachers and administrators are then extrapolated from the model.

CHAPTER 2

THE VOCATIONAL APTITUDE ASSESSMENT MODEL

Vocational aptitude assessment is a process by which the individual gains insight into his/her vocational potential or those characteristics that have a bearing on vocational behavior--aptitudes, motivations, abilities, interests, personality traits, and self-concepts. The individual, with the aid of a counselor, may then attempt to select educational and vocational training and experiences that match the characteristics.

The assessment process should be both periodic and continuous. It is periodic in that diagnoses are made using tests, interviews, observations, and other means on a spedific day or within a short span of time. Vocational aptitude assessment is continuous in that choices, interests, experiences, and external factors constantly bombard the individual and thus re-evaluation and decision-making should be continuous over a long period of time.

A systematic approach to vocational aptitude assessment enhances the individual's probability of successfully completing a vocational program and having a satisfactory career. Experts generally agree that vocational aptitude assessment for the handicapped students includes six types of data: medical assessment, work/living skills, educational assessment, psychological assessment, physical assessment, and vocational aptitudes and interests. Inherent in the psychological assessment are attitudes, maturity, and motivation areas.

General agreement has not been reached on either the formal process, the diagnostic tools and measures to be used, or the role of the vocational teacher in development of the IEP. Therefore, a series of models will be reviewed so that local schools may choose or combine models to fit its geographic and administrative situation.

SITES FOR VOCATIONAL ASSESSMENT

A systematic approach to vocational aptitude assessment involves many data-gathering components which are often time-consuming and expensive. Furthermore, some diagnostic tests and tools may not be in daily use unless the student population is very large.

Therefore, educational institutions and governmental agencies (such as local schools, post-secondary institutions, area centers, rehabilitation agencies, CETA programs) may find it beneficial to develop evaluation centers in several ways, such as:

(1) Interagency Evaluation Center
(2) Local School-Based Center (if school district is large enough)
(3) Evaluation Center at Area Vocational Education Center
(4) Special Summer Programs at Residential Centers

With careful planning and scheduling, such centers may serve "regular" students and those with special needs--culturally disadvantaged, mentally handicapped, physically handicapped, emotionally disturbed, and learning disabled.

Administrative guidelines and procedures should be developed prior to and during the operation of the cooperative assessment centers in terms of scheduling, costs, staffing, interchange of data, and other matters.

The advantages of a cooperative center are many: (1) Costs may be reduced if spread over a larger population if the center is in use full time; (2) A greater variety of paper-and-pencil tests, interviews, and work samples measures can be made available; and (3) Low incidence handicaps may be identified with the potential for developing innovative programs for those individuals.

In geographic areas with sparse populations, the residential and/or mobile trailer center may be most beneficial; at other times it may be best to transport the student to another center than to provide every diagnostic tool and/or measure in each vocational assessment center, especially for the low incidence handicaps.

COMPONENTS FOR A VOCATIONAL APTITUDE ASSESSMENT PROCESS

The vocational aptitude assessment model should consist of these components:

(1) Philosophy and statement of objectives
(2) Management system with controls
(3) Referral process
(4) Standards and evaluative criteria for acceptance/rejection of students
(5) Data gathering procedures
(6) IEP and instructional plan development
(7) Review, re-evaluation, and feedback procedures
(8) Program Review
(9) Staffing
(10) Research

These ten components need to be built into all vocational aptitude assessment models; some components consist of guidelines while others consist of activities.

Although all components are important, this report will deal in greater detail with two: data gathering procedures and IEP and instructional plan development. The local school and/or its assessment center will make the final determination about the actual diagnostic tools/ measures as well as the management system used to control the process.

PRINCIPLES UNDERLYING VOCATIONAL ASSESSMENT

Vocational aptitude assessment is a process by which the individaul gains insight into his/her own vocational potential and the professional educator gains valuable insight into the individual's potential. It is a process in which every student--whether handicapped or nonhandicapped--should participate. Such an assessment helps the student learn about his/ her interests, abilities, aptitudes--and about jobs/careers in which these talents might be used.

Vocational assessment is a two-pronged process: (1) knowing oneself and (2) matching potential abilities to likely jobs/careers. In fact, career education programs espouse the process of students becoming aware of, exploring, and training for careers.

The principles of vocational aptitude assessment then include the following concepts:

(1) The vocational aptitude assessment process should be available to all students including the handicapped and disadvantaged.

(2) The vocational aptitude assessment should be comprehensive in nature and provide data about physical and mental capabilities, aptitudes and interests, and potential for success.

(3) Vocational aptitude assessments should be diagnostic in nature rather than being used as a screening or discriminatory device.

(4) Vocational aptitude assessments should be flexible in that diagnostic tools and measures are selected for individuals while also using some common tests for all individuals.

(5) Because vocational aptitude assessments are relatively new when dealing with the handicapped in the educational setting and mainstreaming, efforts should be made to collect data for research and improvement of programs.

(6) Vocational aptitude assessment is not an end in itself; assessment should be followed by a series of educational experiences leading to development of employability and occupational skills, depending on the individual's abilities and vocational potential.

(7) Qualified personnel should be involved in the vocational aptitude assessment process and decisions.

(8) Students, or their legal representatives, should be aware of the results of such assessments.

In addition to these principles, vocational aptitude assessments must be conducted with due respect for rights and privileges of the individual under the law.

OBJECTIVES OF VOCATIONAL APTITUDE ASSESSMENT

The objectives of vocational aptitude assessment of the handicapped for vocational training purposes include the following:

(1) To assist the student in obtaining a good self-image and an awareness of his/her vocational aptitudes, abilities, interests, and potentials

(2) To develop student awareness of the physical, educational, academic, and training requirements of various occupational

areas, particularly those in which he/she displays the necessary aptitude, interests, preferences, manual dexterity, and occupational potential to function successfully

(3) To develop student awareness of work behaviors and attitudes that employers expect in the world of work

(4) To provide accurate data to educators for assisting the student

(5) To assist in formulating vocational curricula/programs/courses geared to students' abilities, preferences, potential, and limitations

In general, the vocational aptitude assessment is a consideration of the student's abilities and potential capabilities; the assessment should provide both positive factors and limitations. The emphasis should be on those things the student can do rather than on what the student cannot do.

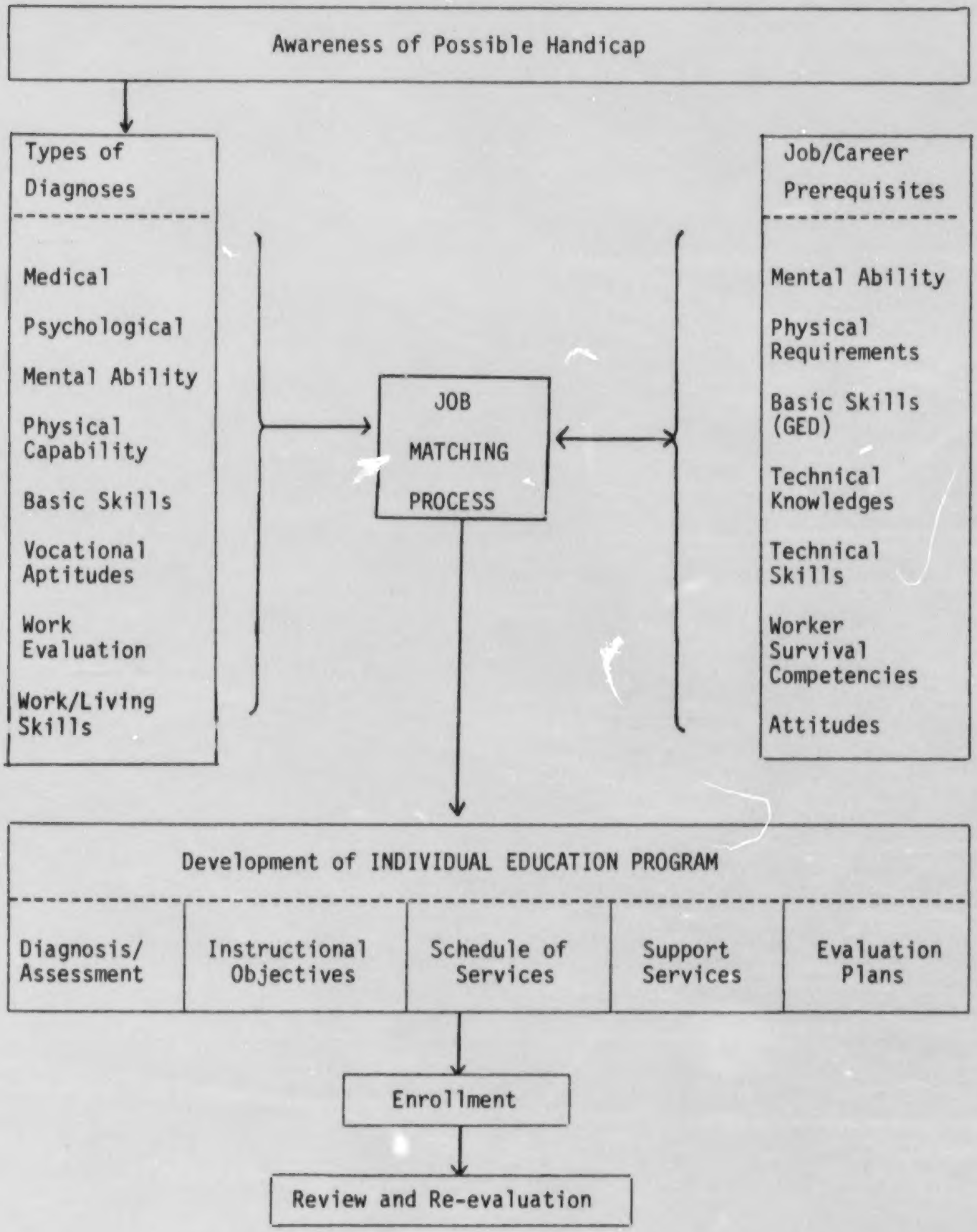
THE GENERALIZED VOCATIONAL APTITUDE ASSESSMENT MODEL

The vocational aptitude assessment model (Figure 3) is a three-pronged process: (1) diagnosis and assessment process, (2) job matching process, and (3) IEP/instructional process.

The diagnosis/assessment process begins when the handicap becomes apparent. The diagnoses take place for two reasons: (a) to determine if the student is eligible for special education services, and (b) to determine his/her potential and limitations. Diagnoses are made in the areas of medical and psychological, mental ability, physical capability, Basic Skills (reading, writing, math--academic abilities), and vocational aptitudes and interests.

After the assessment has been completed, the data is in the job matching process. That is the data are matched to the work, worker traits,

FIGURE 3. A GENERALIZED VOCATIONAL APTITUDE ASSESSMENT MODEL FOR HANDICAPPED


Awareness of Possible Handicap
Types of Diagnoses
Medical
Psychological
Mental Ability
Physical Capability
Basic Skills
Vocational Aptitudes
Work Evaluation
Work/Living Skills
JOB MATCHING PROCESS
Job/Career Prerequisites
Mental Ability
Physical Requirements
Basic Skills (GED)
Technical Knowledges
Technical Skills
Worker Survival Competencies
Attitudes
Development of INDIVIDUAL EDUCATION PROGRAM
Diagnosis/ Assessment
Instructional Objectives
Schedule of Services
Support Services
Evaluation Plans
Enrollment
Review and Re-evaluation

typical working conditions, educational qualifications, and other work-related prerequisites. This process uses the DICTIONARY OF OCCUPATIONAL TITLES (called DOT) system, counseling and guidance systems, and local employment opportunites and demands.

After the job matching process has taken place, the IEP committee determines the vocational program or course that best meets the needs of the individual handicapped student. The IEP is then developed; it includes both long-term and short-term objectives, class placement, related (support) services needed, date service is to begin, statements about instructional strategies and materials, competency levels needed, and date to review the student's progress. A sample IEP form used by the Fayette County (Kentucky) Public Schools appears in Appendix A.

Each of three prongs of the vocational aptitude assessment automatically includes periodic evaluation and review of both the system and the student.

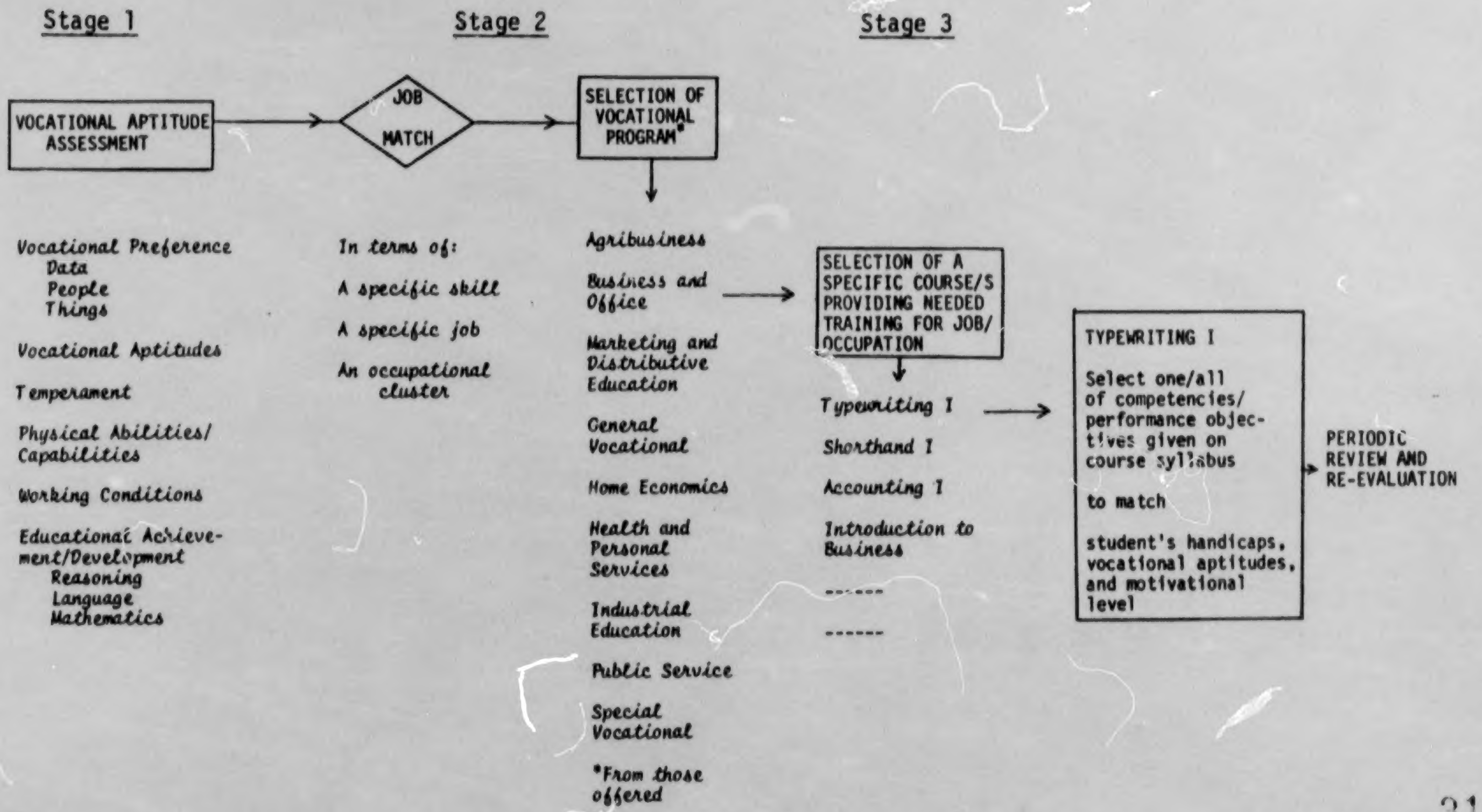
TIME-LINE PROCESS FOR THE VOCATIONAL APTITUDE ASSESSMENT MODEL

A time-line model for the vocational aptitude assessment process appears in Figure 4. Details relating to the various stages in the process model appear as items under each one. These will be discussed in subsequent chapters of this report.

OTHER MODELS

Other organizations have developed vocational aptitude assessment models to fit their specific needs. The CETA Program Intake and Assessment Model (Appendix B) is designed for adults. The Wisconsin Vocational Studies Center Modification Process Model (Appendix C) treats students.

FIGURE 4. TIME-LINE MODEL FOR VOCATIONAL APTITUDE ASSESSMENT MODEL


Stage 1
Stage 2
Stage 3
VOCATIONAL APTITUDE ASSESSMENT
JOB MATCH
SELECTION OF VOCATIONAL PROGRAM*
Vocational Preference
Data
People
Things
Vocational Aptitudes
Temperament
Physical Abilities/ Capabilities
Working Conditions
Educational Achievement/Development
Reasoning
Language
Mathematics
In terms of:
A specific skill
A specific job
An occupational cluster
Agribusiness
Business and Office
Marketing and Distributive Education
General Vocational
Home Economics
Health and Personal Services
Industrial Education
Public Service
Special Vocational
*From those offered
SELECTION OF A SPECIFIC COURSE/S PROVIDING NEEDED TRAINING FOR JOB/ OCCUPATION
Typewriting I
Shorthand I
Accounting I
Introduction to Business

TYPEWRITING I
Select one/all of competencies/ performance objectives given on course syllabus
to match
student's handicaps, vocational aptitudes, and motivational level
PERIODIC REVIEW AND RE-EVALUATION

The Flow Chart of Vocational Evaluation Activities is a model presented by the Maryland State Department of Education, Division of Vocational Education (Appendix D) A more detailed Assessing Student Needs model has been developed in Colorado (Appendix E).

SUMMARY

The vocational aptitude assessment model must meet the needs of the local area; it must be well designed, well organized, and easy to use if it is to be successful in practice. Consideration must be given to the financial costs, of course, but greater consideration should be given to the model's effectiveness in meeting the needs of the handicapped students.

CHAPTER 3

DIAGNOSTIC TOOLS AND MEASURES

The vocational aptitude assessment process should include a variety of well-chosen diagnostic tools and measures. They should be selected to give a comprehensive picture of the handicapped individual--showing what that person can do or has the potential for doing. The assessment must also determine what the handicapped individual cannot do.

While the handicapped student's present abilities and capabilities can be diagnosed with a good degree of certainty, the potential capabilities cannot. Data may be utilized to predict, to point the way, to indicate--but the level of achievement results from the individual's abilities and motivational level. Furthermore, the handicapped individual may not exercise some capabilities because they lack experience and/or practice in that area.

Thus, the vocational aptitude assessment process is a difficult one--at best, it should open doors for the handicapped individual rather than shutting them or being used to "eliminate" the person from programs.

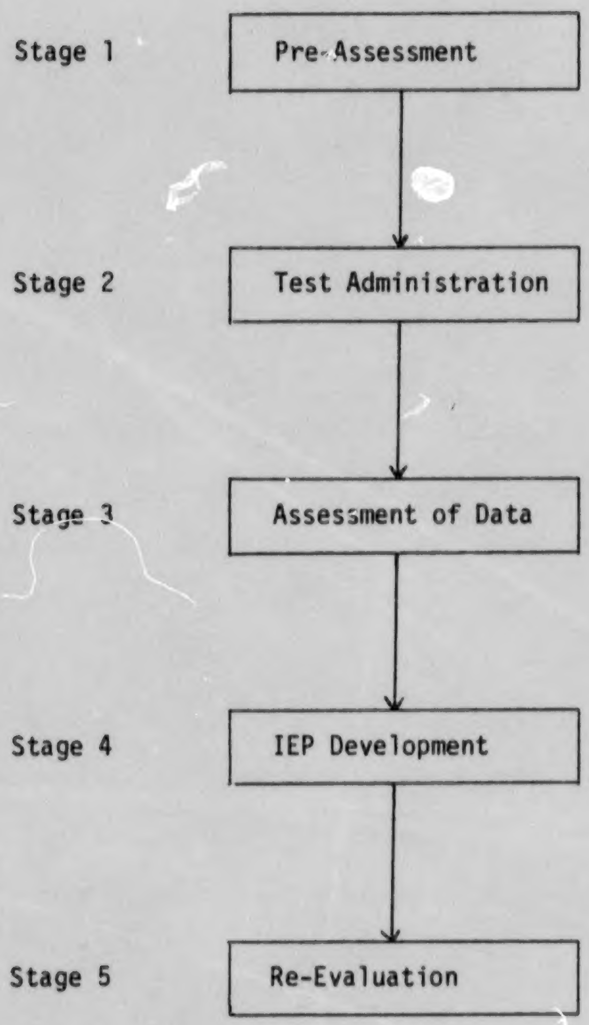
STEPS IN THE VOCATIONAL APTITUDE ASSESSMENT PROCESS

The vocational aptitude assessment process (Figure 5) has five major steps: (1) Pre-assessment, (2) Test administration, (3) Assessment of data, (4) IEP development, and (5) Re-evaluation.

Pre-Assessment. The local school should determine the process to be used, the personnel responsible for each phase, the "common" diagnostic

FIGURE 5

STAGES OF THE VOCATIONAL APTITUDE ASSESSMENT PROCESSS


Stage 1
Pre-Assessment
Stage 2
Test Administration
Stage 3
Assessment of Data
Stage 4
IEP Development
Stage 5
Re-Evaluation

tests and measures for all handicapped students, the "special" tests for specific handicaps when necessary, the physical facilities for the evaluation lab, the reporting process, and the management system.

The personnel for each step in the assessment process should have appropriate professional training for their duties and responsibilities.

The management system for the local school should include protection of the legal rights of the handicapped student, due process procedures, financial arrangements, reports/operational procedures, and evaluation procedures.

Test Administration. A management system and special facilities are needed for housing and administering the diagnostic tools. If an interview is used, the facilities should be such that privacy is possible. Paper-and-pencil tests should be given where individual work can be controlled and where there is little or no interference from others, noise, distractions, or poor lighting. If counselor/teacher observation are part of the test, then the handicapped student should be placed where the observation can be made unobtrusively.

The administration of paper-and-pencil tests, work samples, and/or other measures should be conducted according to the manual supplied by the publisher. Time limitations should be carefully observed unless there is a modification to accommodate the individual's handicap.

Analysis and Interpretation. Judicial interpretation of the data should be made by professionally trained personnel. The counselor should interpret the scores and the vocational teacher should interpret their effect on the individual's potential performance in the vocational course, the job, and the career. It is, however, a joint responsibility.

IEP Development. The IEP is developed jointly and as part of the overall analysis of data. The IEP, however, contains more than data--it is a contract for services for an individual. The full scope of the items is shown on the sample IEP in Appendix A; further discussion occurs later in this report.

The vocational teacher must be involved in the IEP development for determining an appropriate class/course/program placement and for developing the instructional objectives, support service requirements, and evaluation procedures.

Re-Evaluation. Re-evaluation--or periodic evaluations--of the handicapped student's progress, as well as the diagnostic assessment when it appears warranted, should be conducted at least once a year or more often if appropriate. These periodic evaluations must be scheduled on the IEP.

GUIDELINES FOR SELECTING DIAGNOSTIC TOOLS AND MEASURES

There are many diagnostic tools and measures available on the market today; others will appear in the future. They should be reviewed carefully so that they fit the "system" in the local school. Here are some guidelines:

1. Select tests that are standardized on a representative sample comparable to the intended population.
2. Select tests that are free of sex stereotyping and racial bias.
3. Select tests that are standardized for the age/grade level and that provide norms and standards.
4. Select only tests that have validity--that is, they measure what they are intended to measure and what you want to measure.

5. Select only tests that have reliability--that is, they provide consistent scores for the same individual if retested.
6. Select tests having different modes of response (oral and written forms, for example) when working with the handicapped.
7. Consider administrative factors--ease of administration, cost, length of time to give the test, and amount of time to get results/feedback.
8. Use observation measures and interview techniques for some types of assessment.
9. Use career exploration courses, prevocational courses, work sample tests, temporary enrollments, and previous work experiences as part of the diagnostic/assessment process when appropriate.

Diagnostic tools and measures may appear in several modes or formats--paper-and-pencil tests, observations, case histories, interviews, work samples, work simulations, and oral tests, to name a few. In a number of tests, the format or mode may need to be changed to accommodate an individual's handicap. For example, a paper-and-pencil test may be given orally to a blind or visually handicapped person; or if the handicapped person cannot write or has great difficulty writing, a recorder may be present to record answers. Oral tests may be administered also to a person who has not learned or cannot read.

Tests may be given in languages other than English in some areas. A needs analysis by Locks, Pletcher, and Reynolds[3] identified existing language assessment instructions for bilingual assessment.

---

[3] Locks, Nancy A.; Pletcher, Barbara A.; and Reynolds, Dorothy. LANGUAGE ASSESSMENT INSTRUMENTS FOR LIMITED-ENGLISH-SPEAKING STUDENTS: A NEEDS ANALYSIS. A cooperative effort between U. S. Department of Health, Education, and Welfare and the National Institute of Education, 1978, Contract No. 400-76-0165.

A checklist form (Figure 6) is useful in examining a number of vocational aptitude tests in a specific area.

WHAT VOCATIONAL EDUCATORS NEED TO KNOW

The vocational aptitude assessment should result in data in six major areas:

1 Medical assessment
2 Physical capabilities
3 Work/Living skills
4 Psychological assessment
5 Educational assessment
6 Vocational aptitudes

The vocational educator's need to know data about a handicapped student exists only to the extent that such data influences the career decision, the vocational training needed, and the instructional process.

Medical and Physical Assessments. Medical and physical assessments are made by the physician (or designated person) when determining the eligibility of the individual as handicapped. Two major types of data result from such assessments: (1) general health, and (2) physical capabilities. Both are interrelated to the handicapped student's choice of a career and vocational program.

A student with certain types of or severe health problems (for example, asthma, cancer, heart condition, diabetes) may have low levels of stamina and physical strength. Some individuals require daily doses of medicine that may impair their stamina and/or reaction time; if so, they should avoid careers that are considered "hazardous" or "dangerous"

FIGURE 6

CHECKLIST FOR RATING VOCATIONAL APTITUDE DIAGNOSTIC TOOLS

Factors	Name/Number of Diagnostic Tool			
	1	2	3	4
For similar population				
For age/grade level				
Free of discrimination (sex stereotyping, racial bias)				
For appropriate reading/nonreading level				
Related to appropriate occupational programs				
Administration time required				
Personnel needed to administer				
Hand scoring or computerized				
Amount of time to obtain feedback				
Initial cost/maintenance				
Available in different modes for Nonreaders				
Bilingual				
Visual impairments				
Hearing impairments				
Orthopedic impairments				
Others				
Facilities needed				
Standardized (norms, reliability, validity)				

Responses may be a "yes" or "no," a rating such as "good" or "fair," figures, or other types of responses.

for everyone. In addition, they may need to avoid some careers that may be dangerous because of the specific type of handicap but that are not necessarily considered dangerous for the healthy person.

Consequently, medical assessments should include data about the type of impairment and its level or severity in these five areas:

(a) general health and medicine reactions
(b) physical abilities and limitations
(c) neurological functions
(d) audiological (hearing) abilities and limitations
(e) visual abilities and limitations

Recommendations and/or prescriptions for occupational therapy and/or physical therapy should be made at the discretion of the physician.

WHAT THE VOCATIONAL TEACHER NEEDS TO KNOW ABOUT--

Medical and Physical Assessment

1. Health problems affecting performance and attendance
2. Levels of strength, stamina, coordination
3. Ability to function efficiently in various work environments (heat, cold, noise, etc.)

Work/Living Skills Assessment. The work/living skills include those activities and knowledges needed to care for oneself independently, such as getting dressed, basic hygiene and grooming, eating, and bathroom habits. These skills should be mastered before the handicapped student enrolls in vocational courses. Judgment is needed, however, in the interpretation of "grooming"--the vocational teacher may need to work further with the student in the type of grooming expected in the work place.

WHAT THE VOCATIONAL TEACHER NEEDS TO KNOW ABOUT--

Work/Living Skills

1. If basic work/living skills are mastered
2. What additional work-related training is needed

Psychological Assessment. Psychological assessments have two major purposes: (1) guidance in making career decisions, and (2) use in the instructional stages. Such assessments range from paper-and-pencil tests administered and interpreted by qualified psychologists and counselors to observations made by teachers in the classroom. Observations may also be made as the handicapped student tries work sample and work simulation tests.

Psychological tests, if used, should be carefully selected to assess the specific capabilities of a career objective and/or vocational training. Such tests when given and/or any observations should provide information that would be helpful to the vocational teacher.

The Wisconsin Vocational Studies Center[4] reported that vocational teachers perceived that the following attitudinal and emotional barriers residing in the handicapped individual prevented he/she from enrolling various vocational programs:

---

[4] Kumar, Vasant. HANDICAPPED PERSONS IN WISCONSIN'S VOCATIONAL, TECHNICAL, AND ADULT EDUCATION DISTRICTS: ASSESSMENT OF EDUCATIONAL TECHNIQUES AND IDENTIFICATION OF BARRIERS. Madison, Wisconsin: Wisconsin Vocational Studies Center, University of Wisconsin, 1977, pp. 27-28.

Poor self image
Lack of confidence
Fear of trying
Fear of accepting responsibility
Fear of opposing family wishes
Poor work attitudes
Unrealistic expectations compared to actual abilities
Unwillingness on the part of parents or guardians to admit that the individual is handicapped
Fear on the part of over-protective parents
Students' negative reactions
Dependence on others created by institutions
Attitude that government support is better than working for low wages

Observational techniques may provide useful information about the behavior patterns of a handicapped individual. The Behavioral Assessment Checklist from the Goodwill Industries of South Florida, Inc.[5] is an example and covers these major areas (Appendix F):

Behavioral Assessment

- Personal appearance
- Physical assets and liabilities
- Mental abilities
- Emotional stability
- Interpersonal relationships
- Work habits

Ratings and Behaviors in Job Sampling

- Learning and comprehension
- Performance characteristics
- Work attitudes
- Interpersonal relations
- Appearance

The Work Sample variety of tests usually include a segment devoted to observation while the individual works at the work samples.

---

[5] U. S. Department of Labor, Employment and Training Administration, INTAKE AND ASSESSMENT: CETA PROGRAM MODELS. Washington, D. C.: U. S. Government Printing Office, Stock No. 029-000-00327-1, 1978, pp. 31-34.

Informal observations conducted by the vocational teacher in the actual classroom setting during trial or regular enrollment may be used to supplement assessments.

WHAT THE VOCATIONAL TEACHER NEEDS TO KNOW ABOUT--

Psychological Assessment

1. Behavior patterns
2. Stressful areas
3. Emotional stability
4. Emotional maturity

Educational Assessment. Occupations and jobs within such clusters require differing abilities and achievement levels in reading, writing, computation, listening, and other educational areas. Handicapped students, as well as nonhandicapped ones, should possess prerequisite abilities and achievement levels for success in the vocational program and on the job. Vocational education programs enroll only those students who want, need, and can benefit from them.

Special vocational programs, if a sizable number of students have a similar handicap and/or educational problems, may be designed to accommodate special needs populations.

Consideration should be given to statements that specific abilities (and/or levels) are required for certain jobs--or whether they are simply desired. Again, the assessments should identify abilities and potential for achievement through training.

WHAT THE VOCATIONAL TEACHER NEEDS TO KNOW ABOUT--

Educational Assessment

1. Reading ability
2. Math/Computation ability
3. Writing ability
4. Reasoning ability
5. Technical background, if any

Vocational Interest and Preference Assessment. The last type of assessment--and perhaps the most important one--concerns the handicapped student's interests and preferences for various types of work. Such assessments should utilize a variety of tools such as paper-and-pencil tests, career education programs, work sample assessments, trial enrollments, work experience programs, and other means.

Assessing an individual involves discovering that person's interest in working with people, things, and data; preference for working inside or outside; and knowledge of careers. Interests and preferences are sometimes influenced by the ability to perform the work easily so that one has confidence. A person's choice of a career is often, however, influenced by irrational and/or subconscious factors and may conceivably be influenced by one's perception (however unrealistic) of the career. Therefore, knowledge about a career or an acquaintanceship with someone performing that type of work is a distinct factor in choosing a career.

Enrollment in a vocational program should take place only after the vocational interests and preferences of the handicapped student are known.

WHAT THE VOCATIONAL TEACHER NEEDS TO KNOW ABOUT--

Vocational Interests and Preferences

1. Whether student is interested in the occupational cluster
2. Whether student has potential for success in the program and job
3. Whether student has realistic expectations and/or actual experience in the occupational area

NAMES OF DIAGNOSTIC TOOLS AND MEASURES

There are many diagnostic tools and measures available, and they are too numerous to list all of them in this report. However, a few are identified here; the local school personnel should apply the guidelines for test selection in determining which tests to use.

Educational Assessment. The following tests, or those already used in the local school, will provide data about the academic abilities of the handicapped student:

Comprehensive Tests of Basic Skills (CTBS)
Iowa Test of Educational Development (ITED)
Otis Quick Scoring Mental Ability Test
Peabody Individual Achievement Tests (PIAT)
Wechsler Intelligence Tests (Wisc-R)
Wide Range Achievement Test (WRAT)
General Aptitude Test Battery (GATB)

Again, counselors and the vocational teachers should select an appropriate test (or tests) using the guidelines listed previously. It is important that only necessary tests be given and that such tests provided needed information. One test may be sufficient in each category, or there may be a need for more than one in some cases.

Furthermore, the local school may have an adequate testing program in the educational assessment and such data may be used during the vocational aptitude assessment.

Physical Assessment. The medical professionals (doctors) conduct basic physical assessments relating to health problems, physical capabilities and strength, and impairments in the hearing, vision, orthopedic, and neuromuscular/neurological areas; therefore, no attempt is made here to identify those tests. The local school should have access to the results of such data insofar as it affects vocational aptitude assessments and instructional programs.

Some of the more common tests that may be used as part of the physical assessment (of both handicapped and nonhandicapped) are:

Tapping Test
Purdue Pegboard
Purdue Perceptual Motor Survey
Crissey Dexterity Test
Parts of the various work sample systems (see
   later section and Appendix H)

Again, there are many tests relating to physical assessment on the market today. Each vocational program area should identify those that are most suitable and relevant to the specific occupational cluster and then request that those tests be used in the vocational aptitude assessment process.

Vocational Aptitude Tests. A variety of paper-and-pencil tests have been developed over the years through research efforts; many of these are currently being revised or have been recently to eliminate racial and/or sex stereotyping.

The vocational aptitude tests in the paper-and-pencil variety* are designed to discover the individual's interests and preferences in working with people, data, and things as well as other somewhat abstract ideas. In recent years these tests have been supplemented and/or combined with the "work sample" type of tests into "systems." Here are a variety of the paper-and-pencil vocational aptitude tests that the local school may want to consider:

GATB--General Aptitude Test Battery
Kuder Preference Record
Aptitude Tests for Occupations
Career Maturity Inventory
Hester Evaluation System
Detroit Clerical Aptitudes Examination
Ohio Vocational Interest Survey
Holland's Vocational Preference Inventory
Strong Vocational Interest Blank
Planning Career Goals (PCB)
SPIB--Social Prevocational Information Battery
VIESA--Vocational Interest, Experience, and Skill Assessment
Differential Aptitude Tests (DAT)
Paynes--Program for Assessing Youth Employment Skills

Again, the local school should identify those tests that best fit their goals and the vocational programs within that school. A sufficient variety of tests should be available for use, depending on the handicapped student. In fact, some of the newer or recently revised tests have prepared special (but comparable) forms of test and/or provide norms and standards for the results.

---

*See Appendix G for name and address of publishers.

Work Sample Assessments. In recent years a movement has been underway to determine vocational aptitudes in a more realistic manner--namely, through the "work sample" approach. This approach is often incorporated into a "system"--that is, a combination of tests of various types including work samples, paper-and-pencil vocational aptitude tests, educational assessments, and general ability tests.

The work samples are simulations of industrial tasks, business operations, or some occupational area. The work sample is built around a series of common tasks, each one taking approximately 10 to 15 minutes to complete. Thus, the work sample test may take from hours to days to complete. Usually the norms are built on the workers in industry doing the actual work.

The work sample approach centers on actual performance rather than on verbal skills, although in some work samples verbal/written skills are built in when necessary--i.e., some business operations. The "hands on" experience in the work sample serves as both an assessment and as orientation. Because the work sample is task-oriented and specifically work-related, it creates less tension and anxiety than the usual paper-and-pencil test.

Work sample assessments should be used in conjunction with other forms of vocational aptitude assessments in most cases. In fact, the student is observed while performing the work sample, and this data is used as part of assessment in the areas of emotional maturity, work habits, frustration and/or stress levels, for example.

Work samples are expensive and therefore may be unavailable to some schools; see the section on interagency centers as one option. Another option includes the use of trial enrollments in various programs.

Some of the work sample assessment tools* are:

COATS (Comprehensive Occupational Assessment and Training System)
J.E.V.S. Work Samples
Micro-Tower

VES (Vocational Evaluation System)--Singer
TAP (Talent Assessment Program)
VALPAR
VIEWS (Vocational Information and Evaluation Work Samples)
VITAS (Vocational Interest, Temperament, and Aptitude System)

Many of these tools include more than the work samples--they include paper-and-pencil tools, behavioral observations, and interviews as well. Each system should be reviewed to see if it meets the needs of the local school's system and its objectives.

SUMMARY

Diagnostic tools to assess vocational aptitudes must be selected to provide a comprehensive picture of the individual. The local school should have on hand a battery of such tools that match its programs and also provide assessments for which they may need to build new programs or find another placement.

The battery of vocational aptitude tests and tools should include a variety of types--paper-and-pencil, work samples, behavioral observations, interviews, and others. Some should be available in various modes/formats to accommodate a specific handicap--i.e., an oral test for an individual with a severe visual handicap.

Last but not least, the trial enrollment approach may also be used beneficially in some cases. Motivational levels toward becoming a productive worker should be enhanced in every phase of the vocational aptitude assessment process.

---

*See Appendix H for name and address of publishers. Some descriptive information is also provided.

CHAPTER 4

THE JOB MATCHING PROCESS

The process of matching a handicapped student's vocational aptitude to jobs and vocational programs is most successful when the links are well organized and based on valid research and data. The DICTIONARY OF OCCUPATIONAL TITLES (DOT) contains job definitions and codes resulting from over 40 years of arduous research effort. The DOT was updated in 1977 and reflects many new job definitions and titles.

The development of vocational aptitude tests has been conducted by such experts as Kuder. Strong, Startle, McCormick, Cronbach, Dvorak, Guilford, Roe, Thurstone, Hester, and others. These experts represent various schools of thought and approaches to career decision making, as do the aptitude tests. In recent years many of these tests have been modified to eliminate racial and/or sex stereotyping and to accommodate the handicapped when necessary.

When handicapped students are counseled about career choices, the counselor and the vocational teacher must recognize that any vocational aptitude assessment is predictive in nature. That is, the assessment indicates occupations/jobs in which the handicapped person may have the potential for success because of preferences and interests in that type of work. Predictions do not guarantee success; motivational levels and other factors outside the individual influence success also. Therefore, the job matching process is complex and time consuming.

THE DICTIONARY OF OCCUPATIONAL TITLE APPROACH

The DOT contains job definitions, job titles, and code numbers that are combinations of various types of job family systems. These items convey four types of data: (1) job-oriented content in terms of work outcomes expressed in task element statements such as "install cable pressurization systems"; (2) worker-oriented content in terms of human behaviors, elemental motions, or personal job demands such as "judging condition/quality"; (3) attribute requirements of jobs in terms of human attributes related to performance (encompassing factors such as education, training, experience, abilities, personality, traits, interests, and physical characteristics; and (4) overall nature of job in broad terms or general descriptions.

The DOT utilizes three separate job family systems (as described by the U. S. Civil Service Commission in JOB FAMILIES: A REVIEW AND DISCUSSION OF THEIR POTENTIAL UTILITY FOR PERSONNEL SELECTION). The first system is called the "Occupational Group Arrangement" in which jobs are arranged within nine broad occupational categories. These are then divided into 80 occupational divisions and then subdivided into several hundred occupational groups. These three levels (categories, divisions, groups) are reflected in the first three digits of the DOT code for any given job title. (See Appendix I for explanation/examples.)

The second group of three digits in the job title reflects another hierarchial system--the various levels of worker functions in relation to data, people, and things. See Appendix J.

The second job family system used in the DOT is the "Worker Traits Arrangement" in which 114 worker trait groups are organized within 22 broad areas of work. These groupings represent worker requirements in terms of educational background, aptitudes, knowledges, interests, temperaments, and physical demands. See Appendix K.

The third job family system is based on the research with the GATB (General Aptitude Test Battery) and is designed for vocational guidance purposes.

Figure 7 is a summary sheet of the factors that are considered in making vocational aptitude assessments and matching these and other data to jobs. All of these items are specified in the DICTIONARY OF OCCUPATIONAL TITLES and its supplements for the majority of the jobs--or job clusters.

PREPARATION OF THE DOT SUMMARIZATION SHEET*

The DOT Summarization Sheet may be used to collect various types of data needed in matching vocational aptitudes to jobs and occupations; the types of data are (Explanations and codes are in the appendices):

A. Vocational Aptitudes (Appendix K)
B. General Educational Development (GED--Appendix L)
C. Data, People, and Things (Appendix J)
D. Interests (Appendix K)
E. Temperaments (Appendix K)
F. Physical Demands (Appendix K)
G. Working Conditions (Appendix K)
H. Specific Vocational Preparation (Appendix K)
I. Special Comments

---

*The DOT Summarization Sheet is an adaptation of the materials prepared by Terrance Hibpshman and Allen Blanton for the MANUAL OF TRAINING, Eastern Kentucky Vocational Rehabilitation Center, November, 1979.

FIGURE 7

DOT SUMMARIZATION FORM

JOB TITLE____________________________DOT NO._____________

A. Vocational Aptitudes

Vocational Aptitudes/Codes ↓	Levels→	Low Aptitude		Moderate Aptitude		High Aptitude
	Codes→	5	4	3	2	1
	Percentiles→	(0-10%)	(10-30%)	(30-70%)	(70-90%)	(90-100%)
G Intelligence						
V Verbal						
N Numerical						
S Spatial						
P Form Perception						
Q Clerical Perception						
K Motor Coordination						
F Finger Dexterity						
M Manual Dexterity						
E Eye-Hand-Foot Coordination						
F Color Discrimination						

B. GED (General Educational Development) Levels:

(Insert recommended levels)

Reasoning	
Mathematics	
Language	

C. DATA, PEOPLE AND THINGS (Circle highest appropriate function)

Data (4th digit)	People (5th digit)	Things (6th digit)
0 Synthesizing	0 Mentoring	0 Setting-Up
1 Coordinating	1 Negotiating	1 Precision Working
2 Analyzing	2 Instructing	2 Operating-Controlling
3 Compiling	3 Supervising	3 Driving-Operating
4 Computing	4 Diverting	4 Manipulating
5 Copying	5 Persuading	5 Tending
6 Comparing	6 Speaking-Signalling	6 Feeding-Offbearing
	7 Serving	7 Handling
	8 Taking Instructions--Helping	

D. INTERESTS. Circle preference for types of work activities or experiences. Circle only one preference on each line as a circled item in the first column automatically indicates the opposite of the item in the second column.

1	Things and objects	6	People and communication of ideas	99	None
2	Business and people	7	Scientific and technical nature	99	None
3	Routine, organized nature	8	Abstract and creative nature	99	None
4	People in social situations	9	Machines, processes, techniques	99	None
5	Prestige and esteem of others	0	Tangible, productive satisfaction	99	None

E. TEMPERAMENTS. Circle one or more to show what the worker must adjust to:

1 Frequent change
2 Repetitive work
3 Little independent action
4 Direct activities of others
5 Frequent contacts with others
6 Frequent working alone
7 Influencing others
8 Stress under time and with risks
9 Complex intellectual tasks (sensory judgments)
0 Complex intellectual tasks (evaluation by criteria)
X Expression of personal viewpoint
Y Precise attainment of standards

F. PHYSICAL DEMANDS. Circle one letter under "Strength" and all appropriate Items 2-6.

1 Strength (lift, carry, push, pull):

S Sedentary-----------------10 lbs. maximum lift
L Light---------------------20 lbs. maximum lift, frequent lift-carry up to 10 lbs.
M Medium--------------------50 lbs. maximum lift, frequent lift-carry up to 25 lbs.
H Heavy--------------------100 lbs. maximum lift, frequent lift-carry up to 50 lbs.
V Very heavy--------- Over 100 lbs. maximum lift, frequent lift-carry up to 50 lbs.

2 Climb and balance
3 Stoop, kneel, crouch, crawl
4 Reach, handle, finger, feel
5 Talk, hear
6 See (acuity, depth perception, field of vision, accommodation)

G. WORKING CONDITIONS. Circle one item in the left column and circle appropriate one(s) in the second column.

No Rating

1 Check only one:
I Inside (75% or more)
O Outside (75% or more)
B Both

2 Extreme cold plus temperature changes
3 Extreme hot plus temperature changes
4 Wet and humid
5 Noise and vibration
6 Hazards
7 Fumes, odors, toxic conditions, dust, poor ventilatior

H. SPECIFIC VOCATIONAL PREPARATION. Circle one item to indicate maximum training needed.

9 Over 10 years
8 4 to 10 years
7 2 to 4 years
6 1 to 2 years
5 6 months to 1 year
4 3 to 6 months
3 30 days to 3 months
2 Short demonstration--30 days
1 Short demonstration only

SPECIAL COMMENTS

The DICTIONARY OF OCCUPATIONAL TITLES provides the job title, its code number and job definition; samples are on the next page. The data known as vocational aptitudes; GED; data, people, and things; interests; temperaments; physical demands; working conditions; and specific vocational preparation are supplied in the supplement to the DOT.

All of these levels for the two jobs--welder-fitter and clerk-typist--are specified on the forms in Figures 8 and 9 as examples.

The local school should identify typical job titles for which the vocational program prepares workers and then develop a DOT Summarization Sheet for each of those job titles (or occupational clusters). The DOT Summarization Sheets should be available to vocational teachers and their students.

THE JOB MATCH PROCESS

There are two approaches to matching the handicapped student's vocational aptitudes to jobs and occupations: (a) a manual approach, and (b) a computerized approach. Usually, the actual process has a little of both.

Some of the vocational aptitudes tests, including the work sample systems, computerize the raw data, match it to the DOT or other data bases, and print out results for the individual student. The counselor/evaluator and the vocational teacher supplement the computer printout with other non-computerized information and relate the results to the local employment situation and the local vocational programs.

In other schools and in some vocational aptitude tests, the counselor evaluates the answers and interprets the results. The remainder

203.362-010 CLERK-TYPIST (clerical)

Compiles data and operates typewriter in performance of routine clerical duties to maintain business records and reports: Types reports, business correspondence, application forms, shipping tickets, and other matter. Files records and reports, posts information to records, sorts and distributes mail, answers telephone, and performs similar duties. May compute amounts, using adding or calculating machine. May be designated according to records typed as TRUST-REMITTANCE CLERK (finan. inst.). May type on or from specialized forms and be designated GUEST-HISTORY CLERK (hotel & rest.); SECURITY INDEX CLERK (finan. inst.); STORAGE-RECEIPT POSTER (clerical). May compile reports and type prescription data on labels in hospital pharmacy and be designated DISPENSARY CLERK (medical ser.). Additional titles: COLLECTION-CARD CLERK (clerical); MOTOR-POOL CLERK (clerical); ORDER CLERK (light, heat, & power); POLICY-ISSUE CLERK (insurance); REMITTANCE-ACCOUNT CLERK (finan. inst.); VERIFICATION-AND-PROXY CLERK (finan. inst.).

355.677-010 FOOD-SERVICE WORKER, HOSPITAL (medical ser.) dietary aide, diet-kitchen aide; tray worker

Prepares and delivers food trays to hospital patients, performing any combination of following duties on tray line: Reads production orders on color-coded menu cards on trays to determine appropriate items to place on tray. Places items such as silver, fruit juice, sugar, cream, milk and butter on trays. Fills vacuum bottles with coffee and apportions food servings according to diet list on menu card. Places servings in blender to make foods for soft or liquid diets. Examines filled tray for completeness and places on cart or dumbwaiter. Pushes carts to halls or ward kitchens. Serves trays to patients. Collects and stacks dirty dishes on cart and returns cart to kitchen. Washes dishes and cleans work area, tables, cabinets, and ovens. Collects and places garbage and trash in designated containers. May record amounts and types of special food items served to patients. May be designated according to type of food trays prepared as NOURISHMENT WORKER (medical ser.); SPECIAL-DIET WORKER (medical ser.); or duty on tray line as TRAY-LINE WORKER (medical ser.)

405.687-014 HORTICULTURAL WORKER (agric.) II

Performs any combination of following duties concerned with preparing soil and growth media, cultivating, and otherwise participating in horticultural activities under close supervision on acreage, in nursery, or in environmentally-controlled structure, such as greenhouse and shed: Hauls and spreads topsoil, fertilizer, peat moss, and other materials to condition land. Digs, rakes, and screens soil and fills cold frames and hot beds to prepare them for planting. Fills growing tanks with water. Plants, sprays, weeds, and waters plants, shrubs, and trees. Sows grass seed and plants plugs of sod and cuts, rolls, and stacks sod. Prepares scion and ties buds to assist worker budding roses. Traps and poisons pests, such as moles, gophers, and mice. Plants shrubs and plants in containers. Ties, bunches, wraps, and packs flowers, plants, shrubs, and trees to fill orders. Moves containerized shrubs and trees, using wheelbarrow. Digs up shrubs and trees and wraps their roots with burlap. May be designated according to employing establishment as GRASS-FARM LABORER (agric.); GREENHOUSE LABORER (agric.); NURSERY LABORER (agric.); ROSE-FARM LABORER (agric.); or according to horticultural specialty as BEAN-SPROUT LABORER (agric.); MUSHROOM LABORER (agric.).

819.361-010 WELDER-FITTER (welding)

Lays out, fits, and welds fabricated, cast, and forged components to assemble structural forms, such as machinery frames, tanks, pressure vessels, furnace shells, and building and bridge parts, according to blueprints and knowledge of welding and metallurgy: Selects equipment and plans layout, assembly, and welding, applying knowledge of geometry, physical properties of metal machining weld shrinking, and welding techniques. Lays out, poisitions, alines, and fits components together. Bolts, clamps, and tack-welds parts to secure in position for welding [WELDER, TACK (welding)]. May assemble parts of bolting and riveting. May repair products by dismantling, straightening, reshaping, and reassembling parts, using cutting torch, straightening press, and handtools, and be designated WELDER, STRUCTURAL REPAIR (welding). May specialize in using one welding process and be designated WELDER-FITTER, ARC (welding); WELDER-FITTER, GAS (welding). May specialize in fitting and welding components of metal tools, dies, and fixtures and be designated WELDER, TOOL AND DIE (welding).

203.362-014 IN-FILE OPERATOR (bus. ser.)

Operates CRT (Cathode-Ray Tube) to post or retrieve credit information and compiles and reports credit information to subscribers of credit-reporting agency: Receives telephone requests from subscribers for information about credit applicants and identifies caller by code. Types coded inquiry details on keyboard of CRT machine for computer input. Reads data from computer printout on display screen to subscriber over telephone, or activates machine to print out information for mailing to subscriber. Occasionally compiles and types additional credit data on machine for input into computer memory bank.

211.462-014 CASHIER-CHECKER (retail trade)

Operates cash register to itemize and total customer's purchases in self-service grocery or department store: Reviews price sheets to note price changes and sale items. Records prices and departments, subtotals taxable items, and totals purchases on cash register. Collects money from customer and makes change. Stocks shelves and marks prices on containers. May weight items, bag merchandise, issue trading stamps, and redeem food stamps and promotional coupons. May cash checks. May be designated according to items checked as GROCERY CHECKER (retail trade)

FIGURE 8

DOT SUMMARIZATION FORM

JOB TITLE Welding DOT NO. 819.361

A. Vocational Aptitudes

Vocational Aptitudes/Codes ↓	Levels→ Codes→ Percentiles→	Low Aptitude 5 (0-10%)	 4 (10-30%)	Moderate Aptitude 3 (30-70%)	 2 (70-90%)	High Aptitude 1 (90-100%)
G	Intelligence		X			
V	Verbal	X				
N	Numerical		X			
S	Spatial			X		
P	Form Perception			X		
Q	Clerical Perception	X				
K	Motor Coordination			X		
F	Finger Dexterity				X	
M	Manual Dexterity			X		
E	Eye-Hand-Foot Coordination			X		
F	Color Discrimination	X				

B. GED (General Educational Development) Levels:

(Insert recommended levels)

Reasoning	3
Mathematics	3
Language	2

C. DATA, PEOPLE AND THINGS (Circle highest appropriate function)

Data (4th digit)

0 Synthesizing
1 Coordinating
2 Analyzing
3 Compiling
[✓ 4 Computing]
5 Copying
6 Comparing

People (5th digit)

0 Mentoring
1 Negotiating
2 Instructing
3 Supervising
4 Diverting
5 Persuading
[✓ 6 Speaking-Signalling]
7 Serving
8 Taking Instructions--Helping

Things (6th digit)

0 Setting-Up
1 Precision Working
[✓ 2 Operating-Controlling]
3 Driving-Operating
4 Manipulating
5 Tending
6 Feeding-Offbearing
7 Handling

D. INTERESTS. Circle preference for types of work activities or experiences. Circle only one preference on each line as a circled item in the first column automatically indicates the opposite of the item in the second column.

[✓ 1 Things and objects]	6 People and communication of ideas	99 None
2 Business and people	7 Scientific and technical nature	[✓ 99 None]
[✓ 3 Routine, organized nature]	8 Abstract and creative nature	99 None
4 People in social situations	[✓ 9 Machines, processes, techniques]	99 None
5 Prestige and esteem of others	[✓ 0 Tangible, productive satisfaction]	99 None

E. TEMPERAMENTS. Circle one or more to show what the worker must adjust to:

[✓ 1 Frequent change]
[✓ 2 Repetitive work]
3 Little independent action
4 Direct activities of others
5 Frequent contacts with others
[✓ 6 Frequent working alone]
7 Influencing others
8 Stress under time and with risks
[✓ 9 Complex intellectual tasks (sensory judgments)]
0 Complex intellectual tasks (evaluation by criteria)
X Expression of personal viewpoint
[✓ Y Precise attainment of standards]

F. PHYSICAL DEMANDS. Circle one letter under "Strength" and all appropriate Items 2-6.

1 Strength (lift, carry, push, pull):

S Sedentary-----------------10 lbs. maximum lift
L Light---------------------20 lbs. maximum lift, frequent lift-carry up to 10 lbs.
M Medium--------------------50 lbs. maximum lift, frequent lift-carry up to 25 lbs.
H Heavy--------------------100 lbs. maximum lift, frequent lift-carry up to 50 lbs.
[✓ V Very heavy]--------- Over 100 lbs. maximum lift, frequent lift-carry up to 50 lbs.

[✓ 2 Climb and balance]
[✓ 3 Stoop, kneel, crouch, crawl]
[✓ 4 Reach, handle, finger, feel]
5 Talk, hear
[✓ 6 See (acuity, depth perception, field of vision, accommodation)]

G. WORKING CONDITIONS. Circle one item in the left column and circle appropriate one(s) in the second column.

No Rating

1 Check only one:
I Inside (75% or more)
O Outside (75% or more)
B Both

2 Extreme cold plus temperature changes
[✓ 3 Extreme hot plus temperature changes]
4 Wet and humid
[✓ 5 Noise and vibration]
6 Hazards
[✓ 7 Fumes, odors, toxic conditions, dust, poor ventilation]

H. SPECIFIC VOCATIONAL PREPARATION. Circle one item to indicate maximum training needed.

9 Over 10 years
8 4 to 10 years
7 2 to 4 years
6 1 to 2 years
5 6 months to 1 year
4 3 to 6 months
3 30 days to 3 months
2 Short demonstration--30 days
1 Short demonstration only

SPECIAL COMMENTS

Involves hazardous equipment: electrical and heat hazards. Some on-the-job environmental restrictions (i.e., working outside) are not duplicated in training area. Check with instructor before student is placed in training.

FIGURE 9

DOT SUMMARIZATION FORM

JOB TITLE Clerk - Typist DOT NO. 203. 362

A. Vocational Aptitudes

Vocational Aptitudes/Codes ↓	Levels→	Low Aptitude		Moderate Aptitude		High Aptitude
	Codes→	5	4	3	2	1
	Percentiles→	(0-10%)	(10-30%)	(30-70%)	(70-90%)	(90-100%)
G Intelligence				X		
V Verbal				X		
N Numerical				X		
S Spatial			X			
P Form Perception			X			
Q Clerical Perception					X	
K Motor Coordination					X	
F Finger Dexterity					X	
M Manual Dexterity				X		
E Eye-Hand-Foot Coordination		X				
F Color Discrimination		X				

B. GED (General Educational Development) Levels:

(Insert recommended levels)

Reasoning	4
Mathematics	4
Language	4

C. DATA, PEOPLE AND THINGS (Circle highest appropriate function)

Data (4th digit)	People (5th digit)	Things (6th digit)
0 Synthesizing	0 Mentoring	0 Setting-Up
1 Coordinating	1 Negotiating	1 Precision Working
2 Analyzing	2 Instructing	2 Operating-Controlling
[✓ 3 Compiling]	3 Supervising	3 Driving-Operating
4 Computing	4 Diverting	[✓ 4 Manipulating]
5 Copying	5 Persuading	5 Tending
6 Comparing	[✓ 6 Speaking-Signalling]	6 Feeding-Offbearing
	7 Serving	7 Handling
	8 Taking Instructions--Helping	

D. INTERESTS. Circle preference for types of work activities or experiences. Circle only one preference on each line as a circled item in the first column automatically indicates the opposite of the item in the second column.

[✓ 1 Things and objects]	6 People and communication of ideas	99 None
[✓ 2 Business and people]	7 Scientific and technical nature	99 None
[✓ 3 Routine, organized nature]	8 Abstract and creative nature	99 None
4 People in social situations	[✓ 9 Machines, processes, techniques]	99 None
5 Prestige and esteem of others	[✓ 0 Tangible, productive satisfaction]	99 None

E. TEMPERAMENTS. Circle one or more to show what the worker must adjust to:

1 Frequent change	7 Influencing others
[✓ 2 Repetitive work]	[✓ 8 Stress under time and with risks]
[✓ 3 Little independent action]	[✓ 9 Complex intellectual tasks (sensory judgments)]
4 Direct activities of others	0 Complex intellectual tasks (evaluation by criteria)
5 Frequent contacts with others	X Expression of personal viewpoint
[✓ 6 Frequent working alone]	[✓ Y Precise attainment of standards]

F. PHYSICAL DEMANDS. Circle one letter under "Strength" and all appropriate Items 2-6.

1 Strength (lift, carry, push, pull):

[✓ S Sedentary]----------------10 lbs. maximum lift
L Light---------------------20 lbs. maximum lift, frequent lift-carry up to 10 lbs.
M Medium--------------------50 lbs. maximum lift, frequent lift-carry up to 25 lbs.
H Heavy--------------------100 lbs. maximum lift, frequent lift-carry up to 50 lbs.
V Very heavy--------- Over 100 lbs. maximum lift, frequent lift-carry up to 50 lbs.

2 Climb and balance
3 Stoop, kneel, crouch, crawl
[✓ 4 Reach, handle, finger, feel]
5 Talk, hear
[✓ 6 See (acuity, depth perception, field of vision, accommodation)]

G. WORKING CONDITIONS. Circle one item in the left column and circle appropriate one(s) in the second column.

No Rating	2 Extreme cold plus temperature changes
	3 Extreme hot plus temperature changes
1 Check only one:	4 Wet and humid
[✓ I Inside (75% or more)]	5 Noise and vibration
O Outside (75% or more)	6 Hazards
B Both	7 Fumes, odors, toxic conditions, dust, poor ventilation

H. SPECIFIC VOCATIONAL PREPARATION. Circle one item to indicate maximum training needed.

9 Over 10 years	4 3 to 6 months
8 4 to 10 years	3 30 days to 3 months
7 2 to 4 years	2 Short demonstration--30 days
[✓ 6 1 to 2 years]	1 Short demonstration only
5 6 months to 1 year	

SPECIAL COMMENTS

of the process is the same; the results are similar. There are usually differences in cost and amount of time to obtain the feedback.

DEVELOPMENT OF THE IEP

After the handicapped student's vocational aptitudes have been matched to the jobs/occupational area, enrollment in a specific vocational program (or prevocational courses in some cases) is considered. IT IS IMPERATIVE THAT THE VOCATIONAL TEACHER BE INVOLVED IN THE ENROLLMENT DECISION AND IN DEVELOPING THE IEP SECTIONS RELATED TO INSTRUCTION.

The typical IEP should resemble the sample in Appendix A; it includes the following types of data related to instruction:

Annual goals in priority order
Class placement (starting data, review date)
List of related services to be supplied
Criterion-referenced short-term objectives
Instructional strategies and materials
Evaluation plans

The criterion-referenced short-term objectives are also known as performance objectives and/or competencies. These may be developed from the task element statements given in the job definition (Figure 7) and supported by appropriate instructionally-derived statements. For example, the clerk-typist task element statement "types reports, business correspondence, application forms, shipping tickets, and other matter" may be translated into competencies such as: (1) Types 2-page reports from rough draft in _____ minutes in correct manuscript form and with all errors corrected; (2) Types five mailable letters of average length from rough draft copy within 30 minutes; and so on.

Note that part of the competency statement came from the DOT job definition but other parts are derived from the requirements for the vocational course as determined by the professional educator and as derived from local employment practices.

The example statements, however, may not be appropriate for the short-term performance objective if the handicapped student is enrolling in the beginning typewriting class. Therefore, the vocational business teacher will need to specify "subobjectives" and/or "instructionally-derived objectives" such as "Type a 5-minute writing at 40 words a minute with no more than five errors."

As stated previously, the vocational teachers in the local school should develop course syllabi in competency terms, with criterion levels, and evaluation processes whenever a specific program and course is first introduced. Such syllabi and its contents should be reviewed periodically to see that it meets the employment needs.

Figure 10 is a good tool for helping vocational teachers develop such syllabi and competencies. The projected job tasks--and accompanying competencies--should be designated as "essential," "important," "desirable," or "if time permits." The "essential" column should be developed with great thought, especially as it relates to decisions about enrolling a student with a handicap.

IF A HANDICAPPED STUDENT NEEDS RELATED SERVICES SUCH AS ADAPTED EQUIPMENT, SPECIAL INSTRUCTIONAL MATERIALS, OR SPECIAL INSTRUCTIONAL ASSISTANCE, THEY SHOULD BE AVAILABLE TO THE STUDENT ON THE FIRST DAY THEY ARE ENROLLED IN THE VOCATIONAL PROGRAM.

FIGURE 10

JOB/TASK ANALYSIS APPROACH TO DEVELOPMENT OF IEP FOR VOCATIONAL EDUCATION

Job Title and/or Course Title:					
Projected Job Tasks (from DOT or . . .)	Level of Importance				Prescribed Learning Activity or Materials (CBVE, text, and . .)
	Essential*	Important	Desirable	If time permits	

Each vocational education course should have a list of job tasks (topics including skills, knowledges, and attitudes) prepared in advance and available for all students. When a physically handicapped student is enrolled, a selection of these job tasks and objectives is easier and will be made according to what is offered to all students.

*"Essential" means that this task is absolutely required for employment at this job title; most tasks will probably be rated as "important" or lower. Also, serious consideration should be given to the possibility of job redesign (eliminating the job task) in the actual employment situation.

---

*Uthe, Elaine F. OCCUPATIONAL OPPORTUNITIES FOR THE PHYSICALLY HANDICAPPED: PART B. MANUAL. University of Kentucky, Department of Vocational Education, and Kentucky Bureau of Vocational Education, Research Coordinating Unit, 1980, pp. 53.

SUMMARY

The vocational teacher and the counselor should cooperate in the job matching and the IEP development process if the needs of the handicapped student are to be met effectively.

However, the vocational program areas need to assess their programs and prepare in advance for meeting the needs of the handicapped student in special ways. ALL students--whether handicapped or not--should be offered high-quality vocational training to meet their individual needs and to meet the needs of employers.

Last but not least--the job matching process, including the vocational aptitude assessments--continue to need additional research and innovative instruction when dealing with the handicapped student. Barriers--both real and imaginary--need to be removed when possible, and vocational educators can help do that in the future.

CHAPTER 5

TEACHER COMPETENCIES

The vocational teacher needs many competencies in order to perform regular duties and responsibilities with both the handicapped and non-handicapped students. Many efforts have been made to document these competencies and develop teacher education materials; for example, the PBTE (Performance-Based Teacher Education) project completed by the National Center for Research in Vocational Education for one hundred different competencies.

Bayne and Caton categorized a series of competencies and performance objectives in the areas of (1) student identification; (2) program planning and management; (3) classroom planning and management; (4) teaching methodology; (5) cooperative vocational education; (6) counseling and human relations; and (7) school and community resources.

Meers identified competencies in the areas of (1) program planning, (2) curriculum development, (3) methods of instruction, (4) evaluation, (5) guidance, (6) human relations, and (7) management of learning and behavior.

Bayne, G. Keith, and Caton, Hilda. DEVELOPING TEACHER COMPETENCIES IN WORKING WITH HANDICAPPED STUDENTS. University of Louisville, Department of Occupational and Career Education and the Kentucky Bureau of Vocational Education, 1979.

Meers, Gary; et al. INTRODUCTION TO SPECIAL VOCATIONAL NEEDS. University of Nebraska-Lincoln, part of National Training Project for the Development and Implementation of Vocational Education Programs Working with the Handicapped, no date.

The Wisconsin Vocational Studies Center developed a matrix approach to topics to be studies in a professional development course dealing with program modification and prescriptive teaching for handicapped students (See Figure 11).

FIGURE 11. MATRIX APPROACH TO PROFESSIONAL DEVELOPMENT COURSE ON PROGRAM MODIFICATION AND PRESCRIPTIVE TEACHING FOR HANDICAPPED STUDENTS

Disability Areas / Training Content Areas	Physical Disability	Mental Disability	Hearing Impairment	Visual Impairment	Emotional Disturbance	Learning Disability	Drug/Alcohol Dependency	Speech Disability	Ex-Offenders	Language/ Cultural Disability	Multiple Disabilities
Awareness of needs, characteristics, and capabilities											
Evaluation: strategy, techniques, utilization											
Adaptation of classroom and building facilities											
Modifying curricula appropriately											
Specialized teaching techniques											
Job placement strategies											
Role of other agencies in serving people with handicaps											

Tindall, et al, MODIFYING REGULAR PROGRAMS AND DEVELOPING CURRICULUM MATERIALS FOR THE VOCATIONAL EDUCATION OF THE HANDICAPPED, Madison, Wisconsin: Wisconsin Vocational Studies Center, University of Wisconsin, 1979, p. 25.

These projects are only three that have been completed; others are available or are in progress at this time. Only those competencies specifically involved with the proposed vocational aptitude assessment model will be discussed here, however.

The competencies were extrapolated from the various past research efforts, the opinions of those interviewed throughout Kentucky, and personal opinion. For convenience they are grouped into four categories: (1) vocational aptitude assessment; (2) job analysis; (3) instructional design; and (4) attitudes.

COMPETENCIES NEEDED

In the vocational aptitude assessment category, the vocational teacher should be competent to:

(1) identify the type of vocational aptitude data needed to determine enrollment in a specific program/course.

(2) identify and/or approve specific vocational aptitude tests.

(3) use the assessment data to determine enrollment, supporting services needed, instructional design to be used, curriculum modification, and equipment adaptation, if any.

In addition, the vocational administrator must be competent in determining commonalities between the vocational education programs, in supervising the system, and in reviewing the system to make improvements.

In the job analysis category, the vocational teacher should be competent to:

(1) identify appropriate jobs for which the vocational program trains.

(2) make job analyses in the local community.

(3) use the DICTIONARY OF OCCUPATIONAL TITLES and its supplements for obtaining job titles, code numbers, job definitions, worker traits, vocational interest levels, and working conditions.

In the instructional design category, the vocational teacher should be competent to:

(1) make task analyses.

(2) write competency statements and set performance objectives.

(3) select appropriate materials (such as CBVE materials available through the Kentucky Bureau of Vocational Education).

(4) adapt teaching methods and instructional modes when necessary.

In the attitudes category the vocational teacher must maintain a flexibility in order to:

(1) establish rapport with each handicapped student.

(2) recognize handicapping conditions and adapt teaching methods and modes to accommodate them.

(3) search for and/or create innovations, adaptations. or varying instructional tools when necessary.

SUMMARY

Vocational teachers do need specific competencies if they are to participate fully and effectively in the vocational aptitude assessment, in development of the IEP, and in program enrollment decisions. Furthermore, vocational teachers need assistance from special education personnel and others if they are work effectively with the handicapped.

Vocational teachers for the most part have readily accepted students of all types and at all levels. They are accustomed to working with individual students on a one-to-one basis as well as with groups. However, as with any other "new" concept, the teacher needs information, assistance, and support in order to do the best possible job.

Greater effort should be made to develop teacher competencies for working with the handicapped during the pre-service teacher education program. However, experienced teachers may also benefit from in-service activities in this same area. Teacher educators, too, need exposure to the handicapped and updating in working with the handicapped.

CHAPTER 6

SUMMARY AND RECOMMENDATIONS

The handicapped student can and should become a productive worker and share in the fruits of his/her labor in the American economic system. Public Law 94-142, the Education for All Handicapped Children Act, mandates participation in vocational training as well as a free, appropriate education in the least restrictive environment possible.

Vocational programs must be accessible to the handicapped--to those who want, need, and can benefit from them. Curriculum modifications and equipment adaptations may be necessary for the handicapped enrolled in some programs; other related and support services may also be needed.

A vocational aptitude assessment should be conducted for each handicapped student, and then an appropriate enrollment in a vocational program may be recommended. In some cases, there may not be an appropriate program in the local setting.

The model proposed in this report is a process-oriented one. The local school may already have parts of this system in use, but careful review should take place to determine that it is the most effective one for the handicapped students. Most likely, some parts should be improved, changed, added, and/or dropped.

The model is also a participative management one--no one person or part of the school personnel should be solely responsible for the development and operation of the vocational aptitude assessment system.

Finally, this report offers suggestions to the local school about the various diagnostic tools and measures as examples of those available. Each school must, however, review their own goals and programs in developing the best vocational aptitude assessment system for its setting.

RECOMMENDATIONS

Each local school should develop a vocational aptitude assessment system; it should include the process, written procedures and forms, and evaluation plans. Each vocational program area should identify those jobs/occupations for which they provide training, develop DOT Summarization Forms for each job, and select appropriate vocational aptitude assessment tools and measures.

Each vocational program should develop appropriate competency statements for each course and each program in the local school. This will be invaluable for both the handicapped and the non-handicapped students enrolled in the program.

Individualized instructional materials should be reviewed (see the Competency-Based Vocational Education materials sponsored by the Kentucky Bureau of Vocational Education as well as those provided by commercial publishers) and made available.

An appropriate management and evaluation system should be incorporated in the vocational aptitude assessment system so that improvements can be made when necessary.

The vocational teachers must be participants in developing the vocational aptitude assessment system, in redesigning the curricula and courses. In-service training may be needed in the areas of writing/selecting competency statements, in developing IEP's for specific types of handicaps, and in instructional methods when a handicapped student is enrolled in the typical vocational program.

IMPLICATIONS

A high-quality vocational aptitude assessment system is needed for both the handicapped and non-handicapped. Although the same system is used, there may be many differences in the actual tests used, the format of the tests, and the standards applied. The handicapped group at this point has a higher priority of need for the vocational aptitude assessment. Therefore, the handicapped student must be given first priority for this assessment.

Successfully trained and employed handicapped workers will be an economical asset to this nation; they will serve as models for other handicapped individuals. Happy, productive workers will be better members of society.

As handicapped students are enrolled in regular vocational programs, they should be reviewed to determine if they will succeed, if more and/or different adaptations and/or accommodations would be beneficial, or if there is a need for special and/or innovative programs. Research and follow-up programs should be devised to enhance the current knowledge and add to it for the benefit of the handicapped individual as he/she prepares for a lifelong career.

ANNOTATED BIBLIOGRAPHY

ANNOTATED BIBLIOGRAPHY

A. Educational Readings

Adelman, Frank W., and Phelps, L. Allen. "Learning To Teach Handicapped Learners," *American Vocational Journal*, April, 1978, pp. 27-29.

Develops the concept of individualization in teaching the handicapped and then discusses special techniques for working with individuals with handicaps such as hearing or physical problems.

Backman, Margaret E. *Performance of Selected Disability Groups on the Micro-Tower Work Sample Evaluation*. ED 152832, 1978.

The Micro-Tower System of vocational evaluation includes work samples for assessing vocational skills, presentations of occupational information, behavioral observations, and group discussions focusing on vocational goals and related concerns. It has been field tested on over 1,200 persons at eighteen sites, including rehabilitation facilities, psychiatric hospitals, correctional facilities, and a school for the mentally retarded. Thirteen work sample tests are designed to measure five skill areas: verbal (want ads comprehension, message taking), numerical (payroll computation, making change), motor (bottle capping, packing, electronic connector assembly, lamp assembly), spatial (blueprint reading, graphics illustration), and clerical perception (mail sorting, filing, zip coding, record checking). This report presents data comparing the performance of a variety of special disability groups to the performance of the general rehabilitation group, which includes all of the individuals who participated in the field testing. Performance data are summarized for groups of the physically disabled, emotionally disturbed, educable mentally retarded, brain-injured, adult offenders, ex-alcoholics, Spanish-speaking, visually handicapped, and deaf.

Barker, Donald G. "Color Perception Requirements of 4,000 Jobs," *Journal of Employment Counseling*, March, 1971, pp. 26-30.

Tabulation of the color discrimination requisities of a representative sample of 4,000 jobs revealed that the great majority of jobs require little or no color perception aptitude. The 2% of jobs requiring above-average color discrimination were listed by Dictionary of Occupational Titles classifications for the use of counselors in the guidance of clients with defective color vision. "It should be noted that the lists of occupations requiring color discrimination are not all inclusive and do not include any occupations that have come into existence since 1956."

Bauman, Mary K. "Guided Vocational Choice," *New Outlook for the Blind*, October, 1975, pp. 354-360.

Notes that many visually handicapped people never have the opportunity to make an effective vocational choice either because their handicap is, or is thought to be, too limiting, or because they cannot picture themselves performing in different types of jobs. Informed vocational choice is not possible unless the individual and those who counsel him are aware of job alternatives as well as the individual's interests, abilities, and those personal qualities that affect job success. Ways of gathering the information needed to make a guided vocational choice are reviewed--through an extensive history, vocational and psychological testing, and extended testing with work samples and situational assessment.

Birch, Warren. "Work Sample Testing for Adults with Special Needs," *American Vocational Journal*, March, 1976, pp. 36-38.

Discusses needs of adults with special needs and their vocational evaluation and career planning at Gateway Technical Institute using work samples and classroom or job tryouts.

Blake, Charles. Recognizing Physical Disability as a Social Problem. ED 156959, 1976.

Physical disability is an enormous psychosocio-economic-medical problem that affects over 24 million Americans. Public policy endorses a multi-disciplinary approach in analyzing this issue. Legislation has broadened the meaning of physical disability to include persons with mental and emotional disorders. Some of the costs associated with physical disability include limited or no participation in the labor market, social isolation, a reduction in national income, loss of productivity, and a reduction of household employment. A human resources approach for assisting the physically disabled incorporates an efficient allocation of public and private resources for elementary, secondary, technical and college education; a job upon completion of one's education; counseling; transportation; medical services; and individualized services. The elimination of architectural barriers will enhance employment opportunities for rehabilitants. Cost-benefit studies verify and support an expansion of government programs to prepare the physically disabled for future life-self-fulfillment. On-the-job training, specialized vocational programs, and bio-engineering adaptions of jobs have increased the productivity and employment opportunities for well-trained, homebound, and other severely disabled persons. Employment in captive markets and sheltered workshops can be improved through the adoption of modern marketing procedures. Moreover, well-trained clients are successful in providing their own job placement.

Briggs, Garry L. "The Vocationally Disabled in Utah: Their Self-Images and Reflected Images from Friends and Employers," Dissertation Abstracts International, 1970, Vol. 30, p. 4014.

Buontempo, Gregory, et al. Vocational Education for the Handicapped: Assistance in Initiating or Strengthening Vocational Programs for Handicapped Youth. New Jersey State Dept. of Education, Trenton. Bureau of Occupational Research. ED 113534, 1974.

The philosophy and programs presented are designed to assist New Jersey educators in planning and developing Vocational Education for the handicapped. An important measure of the success of such education, the handicapped person's ability to get and hold a job, is described. Federal legislation providing for more training for the handicapped is briefly outlined. Twelve categories of handicapped persons are used for educational classification and are defined here: mentally retarded educable, mentally retarded trainable, neurologically impaired, perceptually impaired, emotionally disturbed, socially maladjusted, visually handicapped, auditorily handicapped, communication handicapped, orthopedically handicapped, chronically ill, and multiply handicapped. The recommended team approach to long-term vocational development involving education and counseling is outlined. Five major phases (each described in detail) of the vocational preparation of the handicapped form a strategy which has often proven effective: (1) vocational evaluation, (2) self and career awareness, (3) skill training, (4) getting started in a real job, and (5) followup. The sequence of programs developed for the handicapped (elementary through high school level and older) includes technology for children, introduction to vocations, employment orientation, work experience and career exploration program, and part-time cooperative employment orientation.

Butte County Superintendant of Schools, Oroville, California. Work-Study Program for Handicapped Children. Final Report. ED 100104, 1974.

Presented is the final report of a 3-year work study program (funded under title VI) to increase the employability of 95 mentally or physically handicapped high school students. Project objectives included determination of requirements for 50 local jobs, development of 50 slide-film sets to provide job task information, assessment of student employability, placement and evaluation of qualified students in appropriate paid work stations, project evaluation, and dissemination of project information. Cited are project strengths (such as successful placement of target students), project weaknesses (such as the need for more job qualification profiles), and recommendations (for workshops/conferences and meetings with local school officials). Reported are project results including determination of employment requirements for 57 local jobs, completion of slide-films and audiotapes for 22 jobs, completion of employability assessment of 85 students, and successful performance by 27 students in paid part-time work stations. Commendations by an audit team include praise for the variety of work stations developed. An appendix of project forms is attached.

Chicago Board of Education. Human Resource Utilization for Special Needs: An Internal Systems Approach. Chicago, Illinois: Board of Education, 1978.

A report on the process of identifying and marshalling resources to aid special education students in the Chicago school system; directed to administrators, counselors, and teachers.

Davidson, Jerry. Competencies Needed by Students Entering Automobile Mechanics Programs in Texas Secondary Schools with Emphasis on Achievement Expectations for the Handicapped. Texas A and M University, College Station. College of Education. ED 173557, 1979.

A study was conducted to identify the competencies needed by students entering auto mechanics programs with emphasis on competencies which handicapped students either possess or could be expected to attain. The research was divided into two parts. First, through two rounds of questionnaires (modified delphi technique) mailed to a panel of twelve auto mechanics teachers in Texas, 48 of 76 competencies listed on the questionnaires were rated as those needed by students entering auto mechanics programs in secondary schools. Second, a panel of special education experts were provided with the list of 48 competencies and were asked to consider each in the light of six handicapping conditions. This information was designed to identify handicapping conditions which would usually prevent a student from possessing entry-level auto mechanics skills and to determine what special assistance could be given to handicapped students to enable them to meet the competencies. Some of the findings include the following: (1) the most needed competencies were social maturity skills; (2) special needs students already possessed most of the competencies needed for auto mechanics; (3) a classroom aide was the most commonly suggested assistance source; and (4) the competency considered most likely to remain out of reach of some of the handicapped students was the ability to drive a car.

D'Costa, Ayres, and Winefordner, David W. "A Cubistic Model of Vocational Interests," Vocational Guidance Quarterly, June, 1969, pp. 242-249.

Describes the rationale for a model dealing with vocational interests.

Depaolo, Ann. Comparison of Hearing Impaired to Hearing Graduates on the High School Graduates Follow Up Career Survey. Northeastern Educational Intermediate Unit, Scranton, PA. ED 138011, 1976.

The postsecondary activities of 16,759 hearing and 21 hearing impaired graduates of 1973 vocational education programs in Pennsylvania were compared. Both groups were administered the high school graduate followup career survey, which measured such factors as motivation to work in the field of study, time period before full-time employment, and gross salary distribution. Results indicated that over half the hearing impaired SS obtained their jobs through parents or relatives compared to 12% of the hearing SS; none of the hearing impaired SS obtained jobs through school cooperative programs, which were cited by 15% of the hearing SS. Other results suggested that more hearing impaired graduates worked rather than going to college. Findings pointed to the need for a greater variety of work oriented programs and supportive services for the hearing impaired.

Dial, Jack G., et al. The McCarron-Dial System--An Approach to Clinical, Vocational, and Educational Evaluation. McCarron-Dial Systems, Dallas, TX. ED 171739, 1978.

The McCarron-Dial System is useful for both vocational and clinical evaluation of neuropsychologically disabled adults. Five factors (verbal-cognitive, sensory, motor, emotional, and integration coping) are used to predict vocational competency, which is measured by work samples and behavior scales, during the first twelve months of a client's vocational program. Wage earnings can also be predicted from level of competency. In the clinical evaluation, the instrumentation remains essentially the same, but a medical examination/history and formal neuropsychological testing are added since, the focus differs considerably. The focus is threefold: (1) diagnosis of organic brain syndrome and locus of a specific lesion; (2) determination of whether the condition is chronic or acute, and static or progressive; and (3) evaluation of the effects of brain dysfunctions on learning and adaptive behavior. A profile and detailed case history is used to illustrate the comprehensive (five-day) version of the evaluation in both a clinical and a vocational setting. A product of a comprehensive research program which began in 1970, the McCarron-Dial System has been used--for rehabilitation counseling, work evaluation, clinical diagnosis, and program evaluation--with adults disabled by mental retardation, cerebral palsy, emotional disorders, drug or alcohol abuse, impaired vision or hearing, and brain tumors.

Dillman, Caroline M., and Maloney, Patricia. Mainstreaming the Handicapped in Vocational Education. Serving the Visually Handicapped. American Institutes for Research in the Behavioral Sciences, Palo Alto, CA. ED 142766, 1977.

One of a series of seven modules developed to improve the knowledge and skills of vocational educators who are or will become involved in the instruction of handicapped students in regular (mainstream) classes, this module is intended for inservice training of vocational educators (including administrators, coordinators, counselors, and preservice trainees) working at the secondary level and focuses on developing a general understanding of the goals, components, and approaches used in regular vocational education programs involving the legally blind and partially seeing. Specifically, the purposes are (1) to familiarize vocational educators with particular handicapping conditions of the legally blind and partially seeing including terminology, variations in severity, and differing capabilities of these students (section 1), (2) to outline and discuss plans for individualizing instruction so that it will meet the needs of visually handicapped students and will simplify the educator's task in teaching these students (sections 2 and 3), and (3) to provide vocational educators with resource and referral agencies (state, federal, private, and nonprofit) and with various publications that can aid them in dealing with visually handicapped students (covered in a separate resources section).

Duquesne Univ. Pittsburgh, PA. School of Education. A Task Analysis Approach to Prevocational and Vocational Training for the Handicapped. Pennsylvania State Department of Education, Harrisburg. Bureau of Vocational, Technical, and Continuing Education. ED 114621, 1975.

The Handbook for special education personnel was written by 18 graduate students culminating a period of intensive work with physically and mentally handicapped adults at workshops operated by the Pennsylvania Association for Retarded Citizens and the Easter Seal Society. The first chapter details the steps from contract procurement to work completion for a sheltered workshop, providing information on workshop organization, time studies, bids, foreman or work supervisor's duties, training procedures, safety, and productivity and reevaluation. Chapter 2 outlines problems in occupational placement and suggests some ways to overcome them. Criteria and methods for evaluating occupational and community living skills are presented in Chapter 3, which also contains vocabulary lists of functional words related to work and to the use of tools. Task analyses, educational and skill prerequisites, and descriptions of 10 job experiences by workshop participants are provided in the fourth chapter. The final chapter describes four additional jobs and the tasks they require. A brief list of information sources concludes the handbook.

Foster, June C., et al. Guidance, Counseling, and Support Services for High School Students with Physical Disabilities: Visual, Hearing, Orthopedic, Neuromuscular, Epilepsy, Chronic Health Conditions. Includes State Resource Directory. Technical Education Research Center, Cambridge, MA. ED 149561, 1977.

Intended for use by high school guidance personnel, the two volumes provide general information and a resource guide on physical disabilities including visual impairment, hearing impairment, orthopedic handicap, neuromuscular handicap, epilepsy, diabetes, and other chronic health conditions. The first section provides an overview of each of the physical disabilities and health problems. The section on coordinating the delivery of services gives information on strategies for planning, coordinating, and delivering services; inservice training; and materials. Personal adjustment is discussed in terms of attitudes toward persons who are physically disabled, self concept, adjustment to physical disability, sexuality and family life, development of independent living skills, development of recreational interests and skills, interpersonal relationships, group counseling, group bibliotherapy, and personal adjustment materials. Educational placement, course selection, and architectural accessibility are among topics considered in the section on educational planning. A chapter on career development and guidance examines such topics as special concerns in counseling disabled students, job seeking, and work oriented activities. Discussed in relation to vocational assessment are sites and covered in the chapter on psychometric testing include the public law nondiscriminatory testing, and specific guidelines for testing disabilities. Suggestions for job placement and parent involvement are also given. Provided are sources for ordering materials and a resource guide. A separate volume contains detailed listings of organizations and directories by state.

Franken, Marion E. Identifying Handicapped Students and Their Vocational Needs for 1977-1982. Madison: Wisconsin Vocational Studies Center, University of Wisconsin, 1977.

Analyzes the data from a survey in Wisconsin in which handicapped students were identified and their needs were determined. Shows types of needs, especially for support services and vocational training.

Fusco, Carol B. Individually Prescribed Program of Instruction for Pupils who are Orthopedically Handicapped. South Carolina State Dept. of Education, Columbia. Office of Programs for the Handicapped. ED 140558, 1977.

Intended for teachers of the orthopedically handicapped, the document provides the framework and resource from which to implement individualized educational programs (IEPS). The first two sections cover the rationale for IEPS, definitions of levels of orthopedic handicaps, and program goals. The bulk of the document consists of IEP activities in the following areas: language arts, mathematics, social studies, science, sensory experiences, creative arts, prevocational/vocational, adapted physical education, self help/self concept, life experiences, and leisure time activities. Activities for each area are presented in table form with information which includes developmental level (primary, intermediate, secondary); degree of physical handicap (moderate, severe); behavioral objective; enabling activities; facilities/materials/equipment modifications/adaptations; and materials and references. Additional sections address the topics of task analysis, communication boards, pupil development assessment, and teaching aids. Also provided is a 24-entry bibliography.

Gellman, William. "Fundamentals of Rehabilitation," Rehabilitation Practices with the Physically Disabled. Edited by James F. Garrett and Edna S. Levine. New York: Columbia University Press, 1973, pp. 3-39.

Provides an overview of the rehabilitation process, the needs of the disabled population, and the techniques and approaches used.

Genrich, Sharon. "The Need for Pre-Vocational Exploration to Include Work Experience for the Physically Disabled," Journal of Applied Rehabilitation Counseling, Fall, 1975, pp. 183-187.

Recommends an equivalent of part-time or summer employment for handicapped adolescents to facilitate exploratory behavior that yields vocational self-knowledge. Increased use of the client's own resources to determine vocational direction is also encouraged.

Gerst, Richard A. "An Analysis of Factors Related to Vocational Decision-Making of a Selected Group of Severely and Non-Severely Orthopedically Disabled Vocational Rehabilitation Clients," Dissertation Abstract International, August, 1976, Vol. 37, p. 805.

Goldman, Leo, and Flugman, Bert. Occupational Counseling for Physically Handicapped Students: A Demonstration and Training Project. City University of New York, N.Y. Institute for Research and Development in Occupational Education. New York State Education Department, Albany. Office of Occupational and Continuing Education. ED 132811, 1976.

Presented is a report of a project to provide occupational counseling to over 60 physically handicapped high school students. Noted are project goals involving direct and indirect provision of services to the students, the training of counselors through a 1-year internship, and the development of a model for a counseling specialty within the special education framework. Sections are given on the introduction and background of the project, application of the counseling program in the schools, the role model, and a half-day conference held at the end of the year. A major section provides descriptive and comparative student data including characteristics of the student population results of evaluations of students' career maturity and career plans, their ratings of life space, and teacher ratings of students. Noted among conclusions are career maturity characteristics of physically disabled high school students, attitude changes in counseling interns, and transferability of counseling skills to other kinds of handicapped clients. It is concluded that the training model and the service model were both validated by the year's experience. Appended are a listing of materials disseminated by the project, sample newsletters, and a student information form.

Goldman, Leo, and Flugman, Bert. Occupational Counseling for Physically Handicapped Students: A Demonstration and Training Project--Phase II. City University of New York, New York Institute for Research and Development in Occupational Education Supervision. ED 149545, 1977.

Reported are results of the second year of a demonstration and training project to develop and test a model for training counselors to promote the vocational development of secondary level special education students. An overview of the project covers the need for the project, features of the new model, program objectives (including the design of an occupational counseling program for mainstreamed physically handicapped high school students), preservice activities (such as selection of the schools and interns), and project conferences. Outlined in a second section are such program components as emphasis on work and career, a developmental/outreach/activities approach, field trips to colleges and non-academic schools, guest speakers, evaluation of field trips and speakers, development of a newsletter, parent meetings, supervision and inservice training of interns, and dissemination and publicity. In section III, the counselor is described as someone who will organize, plan, arrange, visit, find services that are not readily available, and at the same time serve as models for the students. In a final section, the student population is described and evaluative information from scores on the career maturity inventory and responses to a career interview are presented. Appended are a sample career interview form, a counselor activity guide, a counselor activity report form, excerpts from a newsletter for parents, a counselor guide for student information form, and an outline of statistical data.

Hill, Michael D. "Job Satisfaction Among the Rural and Urban Orthopedically Disabled in Wyoming: A Follow-Up Study," Dissertation Abstracts International, June, Vol. 37, 1977.

Iowa State Department of Public Instruction, Des Moines. Special Needs Section. Vocational Assessment Systems: Application in Programs Serving Special Needs Populations. ED 106654, 1973.

A two-day workshop in Council Bluffs, Iowa, organized by the Special Needs Section, Iowa Department of Public Instruction reviewed commercial vocational assessment systems for possible inclusion in educational programs in secondary public schools, area vocational and community colleges, and correctional institutions. The document consists of compilations of workshop presentations as well as supplementary information on the Wide Range Achievement Test, APEX (American Paper Exporters Association), and Talent Assessment Programs. Four presentations were related to the Singer Graflex System and its uses for career exploration as well as for mentally retarded and correctional programs. Two presentations covered JEVS (Jewish Employment and Vocational Service, Philadelphia) work sample battery and its implications for community colleges. One described the Tower (Institute for Crippled and Disabled, New York) System of Vocational Evaluation, while another provided a JEVS/Singer Graflex/Tower Comparison. A concluding section by the Chief, Special Needs Section, provides workshop observations and implications. The workshops indicated no specific vocational assessment system provides total comprehensive evaluation; each system has its strengths and weaknesses. Tool handling success is dependent upon evaluator skill with clients. Likewise, various assessment systems have different implications with special needs groups. (Descriptive information is accurate as of March, 1973).

Jernberg, Donald E. Special Vocational Program for Handicapped Youth and Adults. Revised Edition. Salina Area Vocational-Technical School, Kansas. ED 118798, 1975.

The Salina Area Vocational Technical School has a special vocational program which provides selected vocational training courses for students with physical, emotional, or intellectual handicaps. The program offers vocational counseling, placement services, work evaluation, job readiness training, and vocational training tryout classes (described in terms of length and tasks involved) include: food service, commercial art, aircraft fabrication, offset printing, custodial maintenance, auto-body repair, small engine repair, welding, diesel mechanics, nursing aides, and crafting. Handicapped students who have successfully completed the work evaluation and exploration phases of the special program are then qualified to enter the regular vocational training program, which includes regular, modified, and short-term courses. A training tryout evaluation sheet, an outline of the vocational training objectives and procedures, and a listing of the educational interpreting services available are included.

Kelley, Catherine H. The Development of Individualized Supportive Services for Physically and Sensorially Limited Adults at a Post-Secondary Area Vocational School. Final Report. January 1975 - June 1977. Bureau of Occupational and Adult Education (DHEW/OE), Washington, D.C., Texas Education Agency, Austin, Division of Occupational Research and Development. ED 146345, 1977.

A project was conducted to develop and implement a coordinated program of supportive services for the physically and sensorially limited adult at the post-secondary level. Phase 1 consisted of removing architectural barriers, establishing an advisory committee, staffing the project, preparing the budget, and purchasing needed equipment. During Phase II the clientele were identified, services were developed. Phase III included special programs, e.g., an awareness week to sensitize the campus and community populations to the problems and needs of the handicapped. The major portion of this document is comprised of appended material, some of which are a bibliography: "Support Services for the Physically Handicapped," which provides a detailed description of the services offered; description of Phase I activities; evaluation and certification procedures for new construction; proposal for removing architectural barriers in parking places; advisory committee members; procedures for support services for the physically handicapped; proposed budget; equipment inventory and description of students served; and papers on college for the physically handicapped, tutorial techniques for the blind, and developing study skills.

Kumar, Vasant. The Cap Approach to Modifying Vocational Programs for Handicapped Students--Volume 2. Business/Office with an Example in Telephone Usage. Madison: Wisconsin Vocational Studies Center, University of Wisconsin, 1979.

One example of an attempt to modify instructional materials to meet the needs of a handicapped student with cognitive, affective, or psychomotor dysfunctions.

Kumar, Vasant. Handicapped Persons in Wisconsin's Vocational, Technical, and Adult Education Districts: Assessment of Educational Techniques and Identification of Barriers. Madison: Wisconsin Vocational Studies Center, University of Wisconsin, 1977.

Identifies successful educational techniques and barriers to success for the handicapped students in vocational education. Provides data about needs and barriers also.

Lennon, Thelma C. Guidance Needs of Special Populations. Columbus, Ohio: National Center for Research in Vocational Education, Ohio State University, 1979.

Defines "special populations" and describes their characteristics. Discusses systemic, transcendent, and stylistic counseling models for working with special populations.

Louisville, University of (Ky). A Transportable Professional Development Module for Mainstreaming Students into Vocational Education. Office of Education (DHEW), Washington, D.C. ED 172903, 1978.

This module is designed to enable the teacher working in an actual school situation with a special needs learner to develop an individualized instruction program based on a diagnostic, prescriptive teaching model. The first of three chapters contains three learning experience activities which are designed to help the teacher demonstrate knowledge of (1) the handicapping conditions and educational goals of special needs learners, (2) delivery systems used in designing instruction, and (3) the diagnostic prescriptive model as it relates to individual instruction. Each learning experience contains an objective, learning activity, optional learning activity, self-check activity, and feedback. Chapter two is a review of related literature. The third chapter contains a training packet to help teachers develop affective and cognitive understanding of the mainstreaming concept and its implications for training people who have special needs to obtain and keep rewarding and satisfying jobs. Objectives, activities, evaluation methods, and learning materials are presented in chart form.

Low, John. "Single Step for Handicapped," Community and Junior College Journal, November, 1975, pp. 18-21.

Describes the "Single Step" program for handicapped adults at Dundalk Community College (Maryland), which consists of 15 one day per week sessions of testing, skills training, guidance, and counseling.

Mann, Philip H. Shared Responsibility for Handicapped Students: Advocacy and Programming. Coral Gables, Florida: University of Miami Training and Technical Assistance Center, 1976 (developed under U. S. Office of Education grant).

A collection of papers dealing with issues and perspectives, including mainstreaming, higher education needs, teacher education models, technical assistance. Descriptions of working models in various educational settings, regions, and states are provided.

Maloney, Patricia and Weisgerber, Robert. Mainstreaming the Handicapped in Vocational Education. Serving the Communication Impaired. Bureau of Occupational and Adult Education (DHEW/BE), Washington, D. C. ED 142749, 1977.

One of a series of seven modules developed to improve the knowledge and skills of vocational educators who are or will become involved in teaching handicapped students in regular education settings, this module, concerned with communication impaired students (those who are deaf or hard of hearing and those who have speech impairments), is designed to (1) explain the meaning of a communication handicap--what it is, what the range of severity is, and how it affects the student's vocational performance, (2) present the vocational educator with guidelines for establishing and carrying out a plan of individualized instruction for the student, and (3) provide listings of resource agencies and further readings to assist the vocational educator who is working with the student with a communication handicap. Important points in setting up an individualized instructional program are considered and suggestions are made for modifying existing programs to overcome problems. Two final sections cover (1) bibliographic sources and resource agencies and persons to enable the vocational educator to check his or her understanding of the ideas presented in the module and to apply the principles discussed to his or her own teaching situation.

Maryland State Department of Education. Vocational Evaluation in Maryland Public Schools: A Model Guide for Student Assessment. Baltimore, Maryland: Maryland State Department of Education, Division of Vocational Technical Education, 1977.

Provides a model for assisting handicapped and disadvantaged students in acquiring vocational training; describes the process, criteria, prerequisites, and forms for carrying out vocational evaluation.

McCaslin, N. L.; Gross, Charles J.; and Walker, Jerry P. Career Education Measures: A Compendium of Evaluation Instruments. Columbus, Ohio: Center for Vocational Education, Ohio State University, 1977.

This handbook describes criteria to use when selecting career education measures and then provides abstracts of career education measures. These measures are classified by type and by educational level.

McKinney, Lorella A. Development of Individualized Education Programs (IEPS) for the Handicapped in Vocational Education. Columbus, Ohio: National Center for Research in Vocational Education, 1979.

Describes the elements of the IEP and the procedures for identification/diagnosis of individual needs. Discusses observation and testing in relation to career goals and in the psychomotor, cognitive, and affective domain. Discusses the steps in completing the IEP and in implementing it.

McMahon, Brian T. "A Model of Vocational Redevelopment for the Midcareer Physically Disabled," Dissertation Abstracts International, December, 1977, Vol. 38, p. 2836.

Meers, Gary D., et al. The Handicapped: Learning, Earning, Contributing. (National Training Project for the Development and Implementation of Vocational Teacher Education Programs for Working with the Handicapped.) Lincoln, Nebraska: University of Nebraska, 1978.

Provides concepts and materials for defining the characteristics of the handicapped, strategies for training vocational teachers of the handicapped, and vocational programming of the handicapped. Provides goals and objectives from various states for planning vocational programs for the handicapped and their teachers.

Neely, Margery A. and Kosier, Mary W. "Physically Impaired Students and the Vocational Exploration Group," Vocational Guidance Quarterly, September, 1977, pp. 37-44.

Studied the effects of the 2-hour structured vocational exploration group on self-ratings of 54 physically impaired (PI) students relative to effects on 89 nonhandicapped (NH) high school students. Completed pre-post and follow-up ratings of the personal importance of work satisfaction and interest-skill variables. Analysis of variance showed no sex or group differences in movement of ratings. Chi-square analysis showed most variation resulting from the girls' ratings: PI girls tended to change more than NH girls or boys. PI SS tended to change ratings more at follow-up than NH SS. Data support the utility of short-term vocational development group approaches for both PI and NH students, since both groups showed about equal amounts of desirable change. (21 ref).

New York, State University of. Vocational Education: A Manual of Program Accessibility for the Physically Disabled Two-Year College Applicant. New York State Education Department, Albany. Bureau of Two-Year College Programs, 1977.

This manual was designed as a resource guide for handicapped individuals interested in two-year occupational training at various institutions within the State University of New York (SUNY) or City University of New York (CUNY) systems. It provides an overview of 50 vocational degree programs, indicates which educational institutions offer such programs, and assesses the following characteristics of each: (1) course requirements (number of papers per course, internship and field trip requirements); (2) classroom procedures (utilization of audio-visual aids, interpreters for deaf persons, oral exams); (3) classroom setting (space for wheelchairs, entry ramps, elevators); (4) course environment (location, temperature, space); and (5) physical and personality demands of coursework (lifting, manual dexterity, kneeling, or oral communication requirements, work under stress, stable work routine). It also indicates characteristics of the jobs which each program leads to, including worker personality characteristics, physical demands, work setting, and requirements for vision, speech, hearing, and eye-hand coordination. The manual also provides brief narrative job descriptions and lists professional associations in the field.

North Carolina State Board of Education, Raleigh. Department of Public Instruction. Handbook for Evaluating Disadvantaged and Handicapped Students for Planning Occupational Education Programs. Division of Occupational Education, North Carolina. Department of Public Instruction, Education Building, Raleigh, North Carolina. ED 052342, 1970.

This handbook is intended for public school educators who are attempting to identify students with special educational needs, diagnose specific causes, and plan programs to meet these unique needs. To help in the evaluation of disadvantaged and handicapped students, the document presents a descriptive list of conditions and characteristics of these students, suggested procedures for evaluation, sources of information to be used by the evaluation committee, and basal instruments.

Pati, Gopal C., "Countdown on Hiring the handicapped," Personnel Journal, March, 1978, pp. 144-153.

Discusses the effect of various legislative acts on employment of the handicapped. Analyzes data from major studies dealing with employment of the handicapped from the employers' view. Provides a taxonomy of motivational needs and approaches involving handicapped employees; discusses labor-management concerns and gives a sample promotional sequence program.

Partners in Career Education, Arlington, Texas. Texas Education Agency, Austin. A Handicapped Student Needs Assessment. ED 155871, 1977.

Presented are findings from a 1977 statewide assessment of the career education performance of 1078 handicapped secondary students on a 45-item screening device. Statistical data are presented for five handicapping conditions (visually handicapped, orthopedically handicapped, auditorially handicapped, educable mentally retarded and language learning disabled) relative to the performance of nonhandicapped students on 26 subcategories, including goal setting, decision making, career information, job interview skills, use of money and resources, and worker interdependence. Other findings presented include highest and lowest performance by subcategory. Specific aspects (answer sheet, instructions, and test items) are discussed in terms of their appropriateness for use with special populations. The descriptions of the nine categories and 26 subcategories in the study are appended.

Phelps, L. Allen. Individualized Education Programs (IEPs): A Handbook for Vocational Educators. Columbus, Ohio: National Center for Research in Vocational Education, 1979.

Describes the IEP and the need for cooperative planning in its development. Describes the processes in building an IEP and provides samples.

President's Committee on Employment of the Handicapped. Facts About Handicapped People. Washington, D. C.

A short brochure depicting data about employment of the handicapped--number of handicapped citizens, statistics about absenteeism, job safety, insurance costs, and other areas.

Prisuta, Richard. A Follow-Up Study of Auditorially, Visually, and Orthopedically Handicapped Pupils in Cincinnati. Final Report. Cincinnati Public Schools, Ohio. ED 048677, 1970.

A follow-up study of aurally, visually, and physically handicapped graduates of the Cincinnati Public Schools was investigated for use in future educational planning for handicapped children. A random selection of 24 aurally handicapped, 15 visually handicapped and 34 physically handicapped graduates were interviewed. Twenty-nine of the group met the criteria of being employed with a measurable wage and employers of all 29 subjects were interviewed. Findings were indicated by the researchers to show that the majority of the handicapped pupils were capable of successful occupational adjustment to unskilled and semiskilled jobs; however, impractical school experiences were not marketable enough to provide economic stability. Recommendations were made that the administration should assume more responsibility for the occupational placement of disabled pupils; the scope of the pre-vocational training program should be expanded to meet the changing labor market demands; and specific program objectives which pair specific skills with specific job opportunities based on employment situations of former pupils should be created.

Rosher, J. H. and Howell, Frank M. "Physically Disabled Students and Achievement Orientations: Self-Concept, Curriculum Track, and Career Aspirations," Journal of Vocational Behavior, August, 1978, pp. 35-44.

A subset of data from a larger investigation on the achievement processes of youth was analyzed in two phases to describe disabled and nondisabled tenth-grade students on certain sociodemographic variables, high school curriculum track assignment, self-concept dimensions, and educational and occupational aspirations.

Ross, Robert T. "Behavioral Correlates of Levels of Intelligence," American Journal of Mental Deficiency, March, 1972, pp. 545-549.

Presents results of a computerized census of all California State Hospitals. Percentages of 11,139 mentally retarded patients for different levels of physical disability, self-help skills, and frequencies of problem behaviors are given. Percentages are shown at 4 levels of retardation: profound, severe, moderate, and mild. As tabulation moves from profound toward mild there are relatively fewer SS with physical handicaps, more trained in self-help skills, and fewer with problem behaviors.

Schechter, Evan S. "Employment and Work Adjustments of the Disabled: 1972 Survey of Disabled and Nondisabled Adults," Social Services Bulletin, July, 1977, pp. 3-15.

Provides data about employment of the disabled, the effects of sudden disability, the needs of the adult disabled, and employment factors. A major study conducted by the Social Security Administration.

Schwartz, Stuart E. Another Step Forward: Evaluation and Placement. Completed at University of Florida, Special Education Department, Gainesville, Florida, and available from National Center Publications, National Center for Research in Vocational Education, Ohio State University, Columbus, Ohio.

_______________. Another Step Forward: A System of Management.

_______________. Another Step Forward: Mainstreaming Handicapped Students into The Regular Classroom.

_______________. Characteristics of Handicapped Students.

_________________. Architectural Considerations for a Barrier Free Environment.

A series of five booklets relating to processes for providing educational and vocational training for the handicapped. Provides broad concepts useful for initiating action.

South Carolina State Department of Education, Columbia. Office of Programs for the Handicapped. An Evaluation Design for the Educational Programs for Pupils who are Orthopedically Handicapped. ED 146760, 1977.

The booklet provides forms for the teacher of the orthopedically handicapped to use in systematically collecting data and designing an appropriate educational blueprint for each student. Pupil development assessment sheets include columns for recording assessment date, date of mastery, level of achievement, and comments for each behavioral objectives. Objectives are provided for the following areas (sample behavioral objectives are in parentheses): language arts (identify a picture after hearing a description); mathematics (understand the concepts of time on the hour); science (answer questions relative to a scientific article); social studies (appreciate holiday customs and traditions); fine arts (participate in a play); sensory experiences (create a design through printing); creative arts (create a pottery sculpture); prevocational (manipulate a stapler); vocational (evaluate clothing needs); physical education (throw a ball); adapted physical education (perform a motor task); self help/self concept (complete a family tree); life experiences (utilize the services of a library); and leisure time activities (enjoy fishing).

Stevens, David W. The Coordination of Vocational Education Programs with CETA. Columbus, Ohio: National Center for Research in Vocational Education, 1979.

Reviews and compares vocational education and CETA in regard to federal funds, target groups, and delivery systems. Discusses interaction between the two groups. Discusses the CETA Amendments of 1978 in detail.

Swearengen, Mary B. The CI-TAB Secondary Program: Career Information and Training Activities for the Blind. Texas Education Agency, Austin. Division of Occupational Research and Development. ED 129032, 1975.

Presented is the CI-TAB (Career Information and Training Activities for the Blind) Secondary Program, a program providing career education for visually handicapped and blind high school students to be available in braille and cassette recordings. Five general discussions (each including a list of concepts covered, suggested learning activities, and a list of test questions) are provided on the following topics: (1) producers and consumers, and goods and services; (2) employment agencies, job placement services, unions, and social security; (3) resumes, applications, and interviews; (4) job classifications and volunteer service; and (5) independence, responsibility, and freedom. Each of 30 job descriptions included answers the following questions: What must this worker do? How amny hours must this person work? How much will this job pay? What abilities will I need? What else is important about this job? What are the prospects and opportunities? How can I prepare for this job? And what other jobs are similar to this? Also included are general suggestions for career education and a list of approximately 50 sources of supplementary vocational materials.

Tarr, Rodney F. and Lewis, James P. 1974-76 Follow-Up of the Physically Handicapped in Pennsylvania. Bureau of Occupational and Adult Education (DHEW/OE), Washington, D. C. Pennsylvania Research Coordinating Unit for Vocational Education, Harrisburg. ED 149165, 1977.

Conducted to assist vocational educators in planning programs for handicapped students, the project examined selective aspects of the vocational education program, adjustments, and present status of the physically handicapped vocational graduates and the views of the employers and parents towards the training of the graduates. The project was designed to describe the following conditions: the current vocational status of the employed and unemployed physically handicapped in Pennsylvania from 1974-1976 in terms of their vocational adjustment and job satisfaction; the vocational education programs at the area vocational-technical schools and vocational rehabilitation centers for the physically handicapped; parental attitudes towards vocational programs; employer attitudes toward the physically handicapped graduate; vocational programs that would be beneficial to employability for the physically handicapped; and types of special services the physically handicapped might need to succeed in the regular vocational programs in public schools. Three major outcomes were reported about three-fourths of the vocational handicapped students; in most cases, occupational training was not related to the first job; and about 93% of the employers of the physically handicapped reported that they would consider hiring another physically handicapped worker. Data collection instruments are included in the report.

Taylor, George E. "Career Counseling with Physically Handicapped Students," Dissertation Abstracts International, November, 1976, Volume 37, p. 2653.

Tesolowski, Dennis G. and Halpin, Gerald. "Modifying Work Personalities of the Handicapped," Vocational Guidance Quarterly, June, 1979, pp. 334-340.

Results of this experiment indicate that instructional guidance, related to job-seeking skills and job-maintenance behaviors, enhances worker personality orientations of physically handicapped sheltered workshop employees. A strong positive change in agreeableness in getting along with co-workers and employers is indicated by the agreeableness scale on the Guilford-Martin personnel inventory.

Tindall, Lloyd, Director. Modifying Regular Programs and Developing Curriculum Materials for the Vocational Education of the Handicapped. Madison: Wisconsin Vocational Studies Center, University of Wisconsin, 1979.

Describes various ways to modify vocational programs for the handicapped and analyzes progress made in these ways. Gives final report on project and describes the materials developed.

Tindall, Lloyd W., and Gugerty, John J. Least Restrictive Alternative for Handicapped Students. Columbus, Ohio: National Center for Research in Vocational Education, 1979.

Provides background and rationale for the "least restrictive alternate" concept—its goals and its restrictions. Describes various interpretations and practices.

U. S. Civil Service Commission. Counseling and Planning for Employee Development: A Supervisor's Guide. Washington, D. C.: Superintendent of Documents, U. S. Government Printing Office (T.A-560).

Although directed to improvement of an employee, the process and the forms for determining areas of improvement are useful in developing IEP's for prospective workers--the vocational student.

U. S. Department of Labor. Intake and Assessment: CETA Program Models. Washington, D. C.: Superintendent of Documents (Stock No. 029-000-00327-1), 1978.

Gives a general description of the CETA Intake and Assessment procedures; describes various methodologies such as tests, interviews, case studies, and observations; describes variations in program models between single versus multiagencies and single versus multifunction approaches.

Valpar Corporation. The Money Game. Tucson, Arizona: Valpar Corporation, 1979.

Provides information on funding sources and funded projects in CETA, vocational education, special education, and rehabilitation.

Viskant, Kathryn. "Vocational Counseling of the Visually Handicapped in Illinois High Schools," New Outlook for the Blind, October, 1969, pp. 251-254.

Wainwright, Clinton O. and Couch, Robert. "Work Adjustment: Potential and Practice," Journal of Rehabilitation, January-February-March, 1978, pp. 39-42.

Discusses background of the work adjustment program for disabled clients, job placement, work and work habits, the relationship of vocational evaluation and work adjustment, job seeking and retention skills.

Walker, Robert A. "Vocational Assessment and Management," Chapter 8 in Principles of Evaluation and Management.

Discusses differences in physician's and counselor's expectations and the need for understanding and cooperation. Identifies and discusses vocational evaluation methods, such as the counseling interview, psychologic (aptitude, interest, proficiency or achievement, personality and intelligence) tests, prevocational units or work samples, and medical tests. Relates to the vocational rehabilitation process.

Watson, Douglas. Deaf Evaluation and Adjustment Feasibility: Guidelines for the Vocational Evaluation of Deaf Clients. New York University. New York Deafness Research and Training Center. ED 149527, 1976.

Intended for vocational rehabilitation facilities, the document presents guidelines for the provision of vocational evaluation services to deaf persons. Explained in Section I is the vocational evaluation process, with chapters covering an introduction and overview, delivery of services to deaf clients, and objectives and process of the vocational evaluation. Section II covers the initial assessment, with chapter on utilization of biographical data, the evaluation interview, and psychometric assessment. Described in Section III is the use of work samples, with chapters covering the use of commercial work samples with hearing impaired clients, and the development of structural work samples in the vocational evaluation of deaf clients. Section IV reviews the use of situational assessment, with chapters on using the rehabilitation workshop for vocational evaluation, the use of vocational training areas, and the job tryout in an actual job setting in the community. Appended material includes summary descriptions of standardized tests used in vocational evaluation; explanations of tests, techniques, and procedures used in the initial assessment phase; sample data forms used in job analysis; guidelines for a model workshop; and a list of sources of additional information and assistance. Provided is a glossary of approximately 90 terms used in vocational evaluation of deaf persons.

Weisgerber, Robert. Vocational Education: Teaching the Handicapped in Regular Classes. Bureau of Occupational and Adult Education (DHEW/OE), Washington, D. C. ED 159852, 1978.

Divided into 7 units, the book provides vocational educational teachers with inservice training on practical knowledge and work skills for working with mainstreamed handicapped students. Unit 1 explores the right of the handicapped, the capabilities and characteristics of the handicapped, training for competitive employment, shaping the training environment, evaluating the program. Attitudes that can affect success in teaching mainstreamed handicapped students are discussed in unit 2; units 3, 4, 5, and 6 deal with individualized instruction for health impaired students, visually handicapped students, mentally retarded students, and students with communications disorders respectively. A plan for action is presented in unit 7, outlining steps for instruction of a specific topic to a specific student.

Weisgerber, Robert. Mainstreaming the Handicapped in Vocational Education. Serving the Orthopedically Handicapped. American Institutes for Research in the Behavioral Sciences, Palo Alto, California. ED 142748, 1977.

One of a series of seven modules developed to improve the knowledge and skills of vocational educators who are or who will be serving the handicapped in regular vocational education settings, this module, concerned with the orthopedically handicapped student and with the health impaired student, is designed to (1) explain what orthopedically handicapped means and to explore the range of vocational capabilities of the orthopedically handicapped student and the ways in which the vocational educator can help these students develop their full vocational potential, (2) present the vocational educator with guidelines for establishing and carrying out a plan of individualized instruction for the orthopedically handicapped student, and (3) provide listings of resource agencies and further readings to assist the vocational educator who is working with the orthopedically handicapped. Important points in setting up an individualized instructional program for orthopedically handicapped students are considered and suggestions are made for modifying existing programs to overcome problems. Two final sections cover (1) bibliographic sources and resource agencies and persons to contact for assistance, and (2) a set of problems/questions designed to enable the vocational educator to check his or her understanding of the ideas presented in the module and to apply the principles discussed to his or her own teaching situation.

Weisgerber, Robert A. and Smith, Claudette A. Improving Vocational Education Services for Handicapped Students. Final Report. American Institute for Research in the Behavioral Sciences, Palo Alto, California. ED 142774, 1977.

The project was designed to develop a comprehensive set of instructional materials for use in the training of vocational educators who will be instructing handicapped students as a part of their regular classes. These materials were to convey information at various levels of specificity, including (1) a general understanding of the attitudes, problems, and concerns which affect the handicapped group, (2) an awareness of the needs arising from selected types of disabilities and impairments, and (3) a strategy for use when planning education for a handicapped student. Priorities for content in the resulting seven modules of instruction were established cooperatively with an advisory panel and were developed in cooperation with consultants knowledgeable in the various handicapping conditions. Overall, the modules were found to meet or surpass the evaluators' expectations in terms of providing information on five main ideas: rights and entitlements, attitudes toward the handicapped, information about different handicapped conditions, training the handicapped for competitive employment, and helping a particular handicapped student.

Willis, Constance H.; Harford, Thomas; and Eddy, Barbara. "Comparison of Samples of Amputee and Nonamputee Subjects on the Strong Vocational Interest Blank," Journal of Counseling Psychology, Volume 17 (4), 1970, pp. 310-312.

Administered the SVIB to 50 male amputees who were participating in a multidisciplinary study at a Veterans Administration outpatient clinic and to 213 male veterans participating in a veterans administration normative aging project. Means and standard deviations were obtained for each group on each of the 59 vocational scales of the SVIB. The amputee sample scored higher than the normative aging sample on 8 scales: dentist, veterinarian, farmer, aviator, carpenter, printer, industrial arts teacher, and vocational agricultural teacher; and lower on 8 scales: psychologist, personnel director, city public administrator, city school superintendent, certified public accountant, accountant, sales manager, and lawyer. Findings support the hypothesis that amputation would be reflected in occupational preference as measured by the SVIB.

Wilson, Edouard L. "The Use of Psychological Tests in Diagnosing the Vocational Potential of Visually Handicapped Persons Who Enter Supportive and Unskilled Occupations," New Outlook for the Blind, March, 1971, pp. 29-88.

Demonstrates on 2 examples the preferred use of individual focused programs against test-focused attention, and discusses techniques applied in diagnosing vocational potential of the visually handicapped who enter supportive and unskilled occupations. Intelligence tests, tests of spatial, mechanical, and motor abilities, cancellation tests, and personality tests are mentioned. Among these latter ones the TAT with an example of a story and its analysis, and projective drawing tests are singled out. It is concluded that "the potentialities of blind clients cannot, and should not, be predicated solely upon statistically reliable aptitude tests." The individual and his resistance to change have to be considered. Clients' stereotyped thinking about jobs available to blind people have to be modified; their irrational feelings concerning blindness and their tendency towards dependency have to be coped with.

Woal, S. Theodore. "A Career Education Program for Visually Handicapped Students," Vocational Guidance Quarterly, December, 1974, pp. 172-173.

Describes the inclusion of visually handicapped Philadelphia Elementary Students in classes on career exploration. In addition to regular room to grow career program procedures, these students receive braille transcriptions of written materials, exposure to visually handicapped, productively employed role-models, and field trips to firms employing handicapped workers.

Worthington, Robert M. Career Education: An Exceptional Concept for the Exceptional. ED 091584, 1973.

Career education is based on the idea that all educational experiences, curriculum instruction, and counseling should be geared to preparing each individual for a life of economic independence, personal fulfillment, and an appreciation for the dignity of work. Properly adapted, career education can increase the opportunities available for the exceptional youth and adult, as it does for all citizens. Five levels of career education are identifiable, each with a strong emphasis on career guidance: career awareness, career orientation, occupational exploration at both the secondary and the postsecondary level, and adult and continuing education. Equal career education for the handicapped may not be the same as for those without disabilities, for the same career education program may result in less than equal educational opportunity. Career Guidance must be responsive to the needs of all in-school youth, including exceptional youth and adults. A pamphlet entitled Suggested Utilization of Resources and Guide for Expenditures assists in reporting and planning programs and services for disadvantaged and handicapped persons. Special programs such as project career education/handicapped, project serve, and the occupational training center in St. Paul help in the education and training of all so that each individual can develop the competencies of self-sufficiency, normal living, and citizenship.

APPENDICES

B. Readings Relating to Employment*

Brief, A. P., and Krefting, L. A. "The Impact of Applicant Disability on Evaluative Judgments in the Selection Process," Academy of Management Journal, December, 1976, pp. 675-680.

The dimensions along which disabled persons are perceived as handicapped within the context of the selection process are investigated. Business students are used rather than experienced employers in reviewing job application files. Disabled applicants are given ratings as high as the nondisabled applicants.

Brosnan, T. "There's More to Affirmative Action Than Just Hiring the 'Handicapped'", The Personnel Administrator, January, 1978, pp. 18-21.

A description is included on how the C and P Telephone Company developed a more comprehensive program in hiring the disabled.

Cant, L. S. "Encouraging the Handicapped Benefits All," Industrial Engineering, November, 1977, p. 39.

An assembly workshop employing mentally and physically handicapped personnel is described. The cost saving, motivational, and social benefits are noted.

"Cost Problems Plague Transit for the Disabled," Business Week, July 3, 1978, pp. 21-22.

The law requiring all federally-assisted facilities and programs to provide access to handicapped has such a high price tag that it seems impossible to implement. The retrofit may be delayed by requiring Transportation Department cost estimates.

"The Disabled: Making Marketers Pay Heed," Sales and Marketing Management, May, 1977, p. 35.

A relatively untapped market lies in the physically handicapped goods line. The international disabled exposition plans to give impetus to this dormant market with such participants as Lazy Boy Chair Co. and Stanley Door Corp.

Dowling, R. J. "Rules on the Rights of the Handicapped May Affect Your Association," Association Management, February, 1978, pp. 56-58.

Government rulings on the rights of handicapped persons will have wide ranging effects on many non-profit institutions, because costly structural changes will be required. It would behove associations which are federal aid recipients to involve themselves in the congressional deliberations.

Eisenberg, R. A., and Orwin, M. "Hiring the Handicapped for Association Work," Association Management, February, 1978, pp. 59-61.

The grocery manufacturers of America recently hired a blind receptionist and found that few adaptations in equipment or office routine were required.

Fox, M. J., and Stack, W. B. "Education for All the Handicapped Children Act, Hearing Officer and the Labor Arbitrator," Journal of Collective Negotiations, Volume 8, No. 1, 1979, pp. 67-75.

A critique of the use of hearing officers in cases required by the Education For All Children Act. The authors strongly recommend the use of labor arbitrators in these cases to ensure the special education rights of handicapped children.

Guest, D. "Failing to See Past the Disabled Label," Personnel Management, August, 1979, pp. 41-45.

The London School of Economics conducted research to explore attitudes and policies of employing registered disabled persons (RDP). A year after Britain's Manpower Services Commission published guidelines, it was found that most personnel managers and trade unions failed in their responsibilities toward RDP's. The pattern of RDP's is changing and the 3% quota system for RDP's was found to be too high.

Hines, J. "Overcoming the Obstacles to Disabled Employment," Personnel Management, March, 1979, pp. 40-45.

Awareness of the problems of the disabled is increasing. Employment is an important gateway towards independence or, at least, less dependence. The future prospects of employing the handicapped relies on both trade unions and management.

"Hiring the Handicapped," Administrative Management, July, 1977, pp. 9-10.

Many employers would be willing, even eager, to hire handicapped workers if they knew where to find them. Mainstream, Inc. now offers a national data base of employable handicapped as a recruiting aid.

Jailer, M. "Accommodating the Handicapped in the Office," Administrative Management, May, 1978, pp. 81-83.

Tips on how to design buildings and offices for the handicapped.

Johnson, W. C.; Curington, W. P.; and Cullinan, P. R. "Income Security for the Disabled," Industrial Relations, Spring, 1979, pp. 173-183.

This paper analyzes conventional methods of evaluating benefit adequacy in public aid programs for disabled workers. Four significant changes are listed and described and implications for potential savings in administrative costs are given. They found severe deficiencies in the standard approaches employed.

Kroger, W. "Disabled Workers Are No Handicap to Business," Nation's Business, May, 1979, pp. 110-114.

Handicapped employees have been found to have less absenteeism, greater productivity and remain on the job longer than others. Most disabled want employment and employers should make greater efforts to hire them. Education and training for these persons is costly,but with more employed the overall cost of handling them would be less.

Louviere, V. "Handicapped Youngsters Prove to be an Asset," Nation's Business, December, 1976, p. 62.

The handicapped children at the Coleytown Development Center are being paid to do work for companies on a contract basis.

Maronick, T. J. "Handicraft Marketing Sales: A Marketing Response to a Social Need," Southern Marketing Association, Proceedings of 1976 Conference, pp. 14-16.

A non-profit organization marketing craft goods made by elderly and handicapped is examined and compared with retailers' marketing activities. HandiCraft Marketing Sales, Inc. uses modern selling techniques to gain revenue for these persons, suggesting a need for assisting skilled craftspersons who have no way to get products into the market.

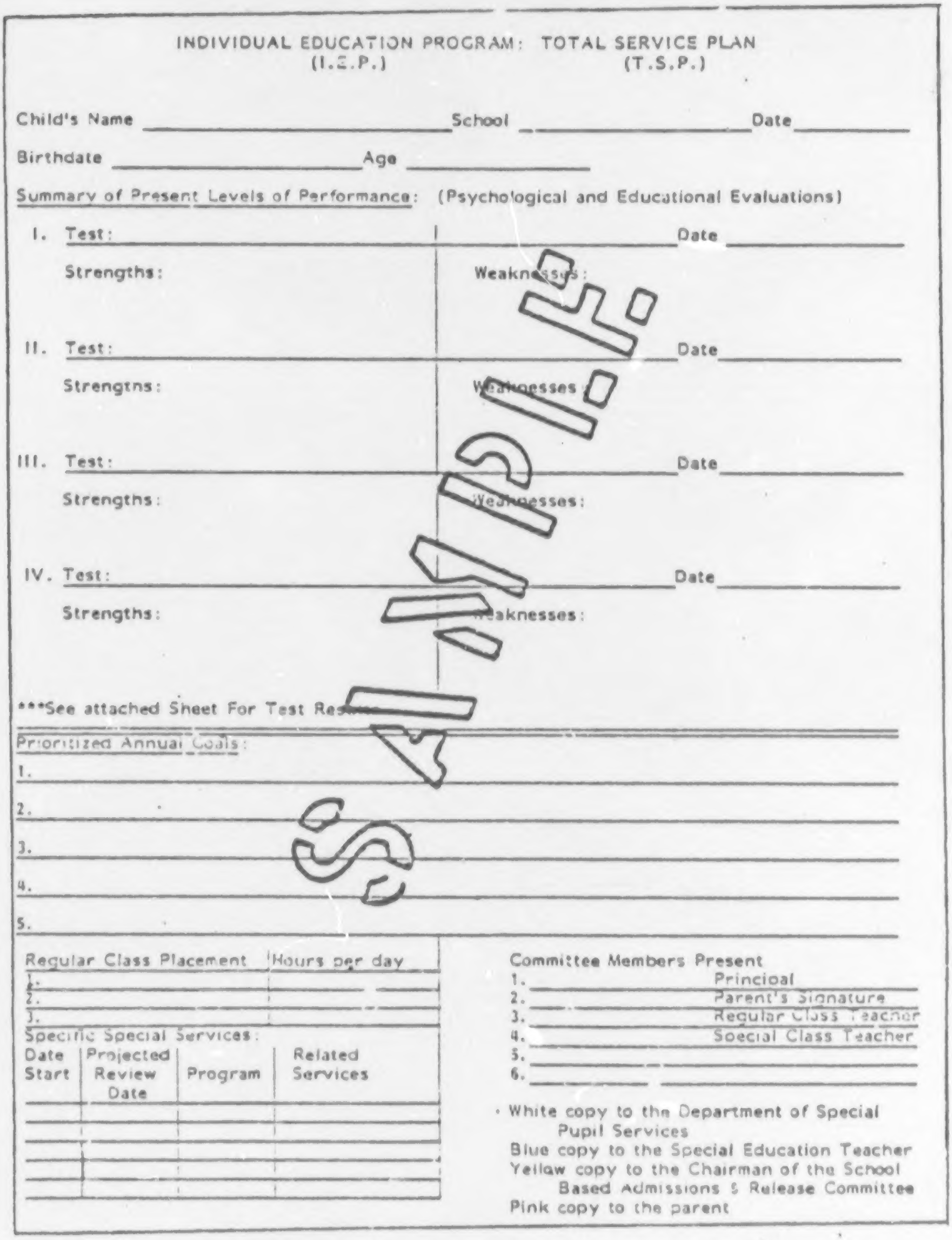
Nathanson, R. B. "The Disabled Employee: Separating Myth from Fact," Harvard Business Review, May-June, 1977, pp. 6-8.

Employers hesitate to hire disabled people because they incorrectly believe that insurance rates will rise, that handicapped people are not productive or dependable, that special accommodations will have to be made for the handicapped, and that morale will suffer.

"The National Association for Retarded Citizens: Mentally Retarded Persons in the Open Market," Personnel Journal, May, 1977, pp. 238-239+.

Almost 95% of the mentally retarded people in the U.S. are capable of employment, with proper training. Corporations employing mentally retarded workers report they have been successful for the most part, with greater degrees of punctuality and job attendance.

APPENDIX A. SAMPLE IEP FORMS (FAYETTE COUNTY)*



INDIVIDUAL EDUCATION PROGRAM: TOTAL SERVICE PLAN
(I.E.P.) (T.S.P.)

Child's Name ____________________ School ____________________ Date __________

Birthdate ____________________ Age ____________

Summary of Present Levels of Performance: (Psychological and Educational Evaluations)

I. Test: ____________________ Date __________

Strengths: Weaknesses:

II. Test: ____________________ Date __________

Strengths: Weaknesses:

III. Test: ____________________ Date __________

Strengths: Weaknesses:

IV. Test: ____________________ Date __________

Strengths: Weaknesses:

***See attached Sheet For Test Results

Prioritized Annual Goals:

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________

Regular Class Placement	Hours per day
1.	
2.	
3.	

Specific Special Services:

Date Start	Projected Review Date	Program	Related Services

Committee Members Present
1. ____________________ Principal
2. ____________________ Parent's Signature
3. ____________________ Regular Class Teacher
4. ____________________ Special Class Teacher
5. ____________________
6. ____________________

- White copy to the Department of Special Pupil Services

Blue copy to the Special Education Teacher
Yellow copy to the Chairman of the School Based Admissions & Release Committee
Pink copy to the parent

---

*Uthe, Elaine F. OCCUPATIONAL OPPORTUNITIES FOR THE PHYSICALLY HANDICAPPED: PART B. MANUAL. University of Kentucky, Department of Vocational Education and Kentucky Bureau of Vocational Education, Research Coordinating Bureau, 1980, pp. 50, 51.

INDIVIDUAL IMPLEMENTATION PLAN (I.I.P.)
Fayette County Public Schools

Date ____________________

CHILD'S NAME:	SCHOOL:	PERSON'S RESPONSIBLE:

INSTRUCTIONAL AREA: ______________________________

ANNUAL GOAL: ______________________________

Criterion Referrenced Short Term Objectives	Instructional Strategies and Materials	Date Start	EVALUATION						Review Date
			Mastery						
			Pre-Test			Post Test			
			Date	Raw Score or Count	% Crit.	Date	Raw Score or Count	% Crit.	

SAMPLE

ANNUAL REVIEW STATEMENT FILED ON FORM EC/EIP-14

White Copy:	Special Pupil Services
Blue Copy:	Parent
Yellow Copy:	Chairperson, School Based Admissions and Release Committee
Pink Copy:	Special Education Teacher

REVIEW RECOMMENDED AT EACH GRADING PERIOD

Admissions and Release Committee

1. ______________________________, Principal
2. ______________________________, Parent's Signature
3. ______________________________, Regular Class Teacher
4. ______________________________, Special Class Teacher
5. ______________________________,

APPENDIX B. CETA PROGRAM INTAKE AND ASSESSMENT MODEL

CETA prime sponsors engage in intake and assessment activities at three levels:

Level 1. Judging eligibility for admission

Level 2. Matching client to activity, such as need for training, job placement, or financial assistance

Level 3. Diagnostics for individualization of services--client assessment as a client-oriented activity to provide sufficient, reliable information to make appropriate plans.

CETA's assessment techniques can be grouped generally as (1) tests, (2) interviews or counseling, (3) historical or case study approach, and (4) observation.

Three varieties of tests are commonly used:

(1) Paper-and pencil tests

General Aptitue Test Battery (GATB), developed by the U. S. Employment Service, measures general learning ability, verbal aptitude, numerical ability, special special aptitude, form perception, clerical perception, motor coordination, finger dexterity, and manual dexterity

Non-Reading Aptitude Test Battery (NATB), an adaptation of GATB for those with limited reading ability, such as the disadvantaged

California Achievement Test, a common measure of reading, vocabulaty, and arithmetic skills

Lorge-Thorndike Intelligence Test is pictorial, diagrammatic, or numeral and assesses an abstract ability to learn

Kuder Preference Method

Basic Occupational Literacy Test (BOLT) measures reading and arithmetic skills of the disadvantaged

Social Access Questionnaire (SAQ) measures six personality factors and includes questions about personal history

---

U. S. Department of Labor. INTAKE AND ASSESSMENT: CETA PROGRAM NEEDS. Washington, D. C.: U. S. Department of Labor, Employment and Training Administration, 1978, pp. 1-9 (Stock No. 029-000-00327-1)

Interest Check List, checklist of occupations for those with sufficient reading ability and knowledge of a wide variety of occupations

(2) Projective tests

Self-Concepts Profiling, a pictorial test that measures work attitudes of the seriously disadvantaged

Minnesota Multiphasic Personality Inventory (MMPI), a clinical instrument that distinguishes between neurotics, psychotics, and "normals"; may be used only by a qualified psychologist with a literate person over the age of 15 who has at least an eighth grade education

(3) Work simulations

Work samples are becoming more popular and are often used to overcome problems of paper-and-pencil tests that measure reading and vocabulary skills. The starred ones are most often used employment and training programs:

*TOWER System
*JEVS (Jewish Employment and Vocational Services System)
*Valpar Component Work Sample Series
McCarron-Dial Work Evaluation System
Singer Vocational Education System (Singer/Graflex)
Talent Assessment Programs
Wide Range Employment Sample Test

However, CETA program models indicate that assessment centers that include work samples must have (1) sufficient time to put a client through a work sample, (2) qualified staff who can understand and interpret the behavior of the client engaged in a work sample, and (3) ample space to accommodate a work laboratory.

The CETA program models also use interviews as a form of assessment; however, the scheduled (guided, structured) interview is used to reduce the number of extraneous variables that might bias the information gathered.

The case study (biographical data) may also be a valuable assessment tool to determine good program risks and to determine what intervention strategies may be necessary with an individual.

APPENDIX C

MODIFICATION PROCESS MODEL BY WISCONSIN VOCATIONAL STUDIES CENTER

The Modification Process Model for Vocational Education of Handicapped students identified by the Wisconsin Vocational Studies Center serves as a guide and revolves around three tasks: (1) identifying the learning disabled student; (2) developing an appropriate educational plan; and (3) providing appropriate instructional strategies. (See diagram on next page.)

The Wisconsin model advocates using five types of data as a base for developing vocational education plans:

(1) Academic Profile: reading level, math level, learning modes, learning deficiencies

(2) Independent Living Profile: hygiene, grooming, safety, social interaction, money management

(3) Emotional Profile: frustration tolerance, anxiety level, communication skills, peer relations, authority relations

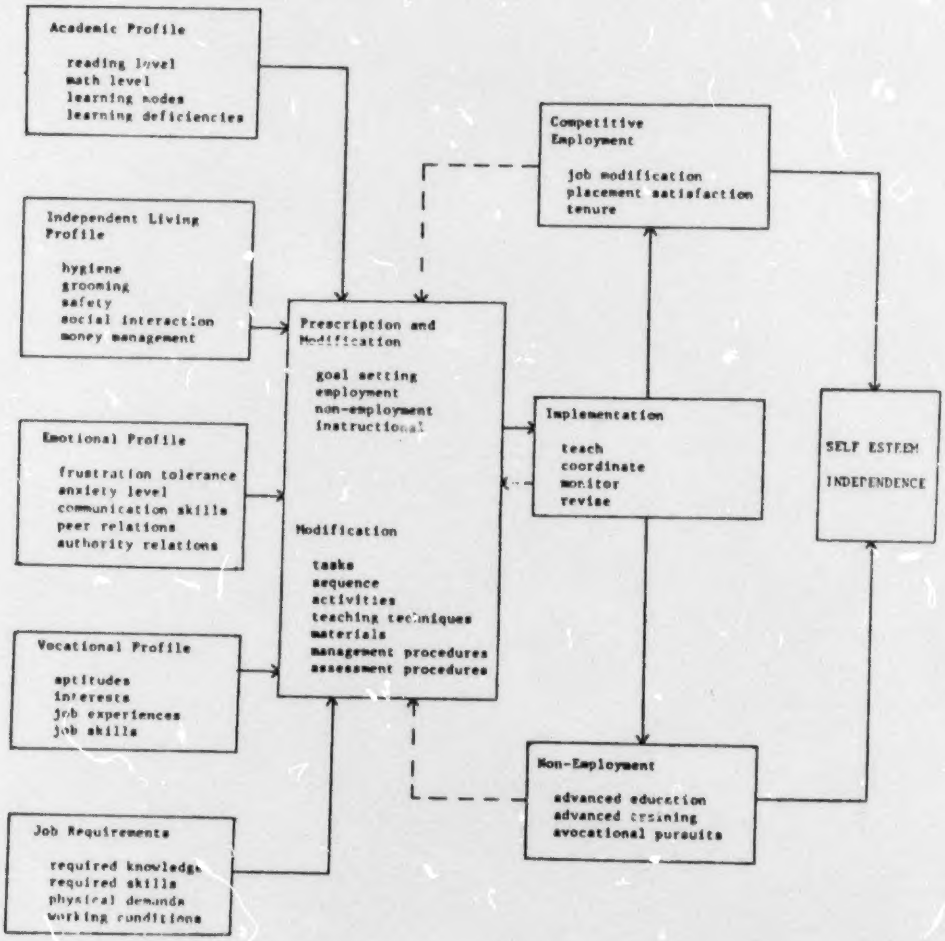
(4) Vocational Profile: aptitudes, interests, job experiences, job skills

(5) Job Requirements: required knowledge, required skills, physical demands, working conditions

These data are then used for prescription and modification, with prescription including goal setting, employment, non-employment, and instructional items and modification relating to tasks, sequence, activities, teaching techniques, materials, management procedures, and assessment procedures.

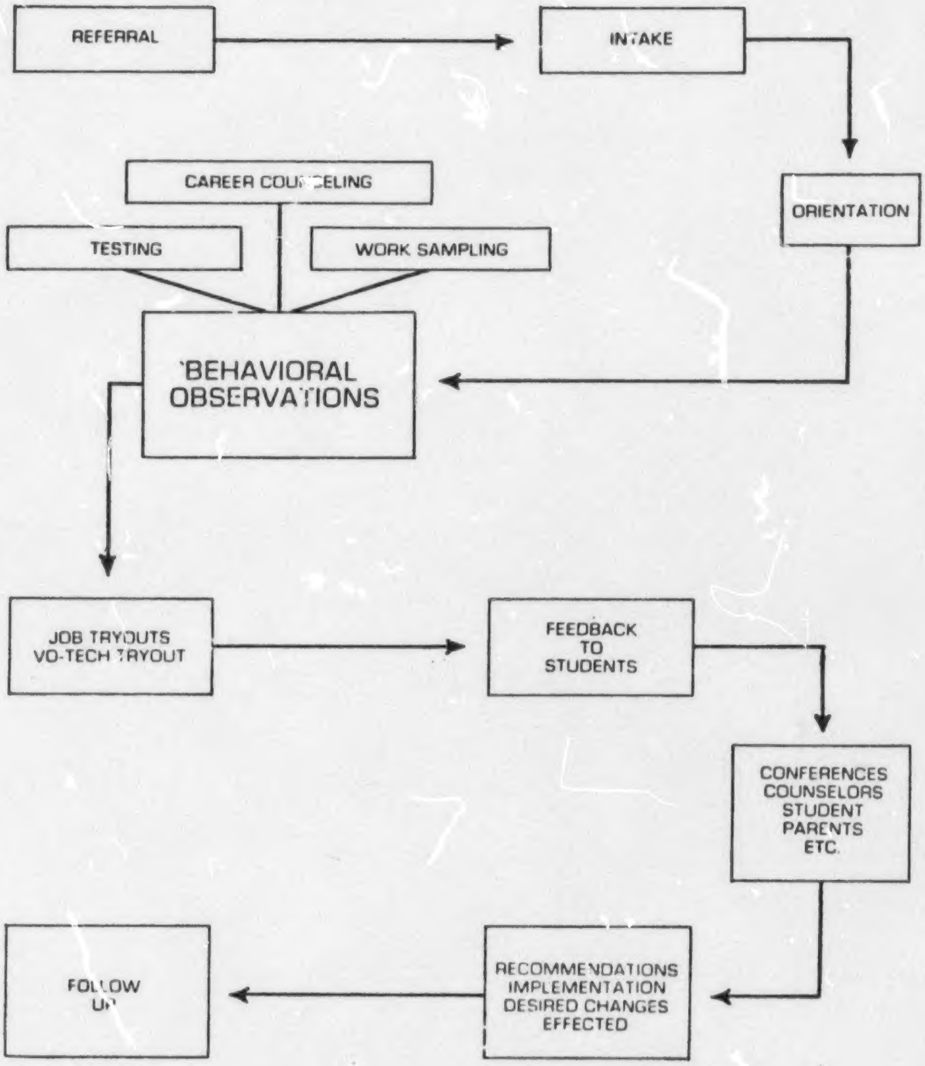
Tindall, et al, MODIFYING REGULAR PROGRAMS AND DEVELOPING CURRICULUM MATERIALS FOR THE VOCATIONAL EDUCATION OF THE HANDICAPPED. Madison, Wisconsin: Wisconsin Vocational Studies Center, University of Wisconsin, 1979, pp. 9-14.

MODIFICATION PROCESS MODEL FOR THE VOCATIONAL EDUCATION OF HANDICAPPED STUDENTS


Academic Profile
reading level
math level
learning modes
learning deficiencies
Independent Living Profile
hygiene
grooming
safety
social interaction
money management
Emotional Profile
frustration tolerance
anxiety level
communication skills
peer relations
authority relations
Vocational Profile
aptitudes
interests
job experiences
job skills
Job Requirements
required knowledge
required skills
physical demands
working conditions
Prescription and Modification
goal setting
employment
non-employment
instructional
Modification
tasks
sequence
activities
teaching techniques
materials
management procedures
assessment procedures
Competitive Employment
job modification
placement satisfaction
tenure
Implementation
teach
coordinate
monitor
revise
Non-Employment
advanced education
advanced training
avocational pursuits
SELF ESTEEM
INDEPENDENCE

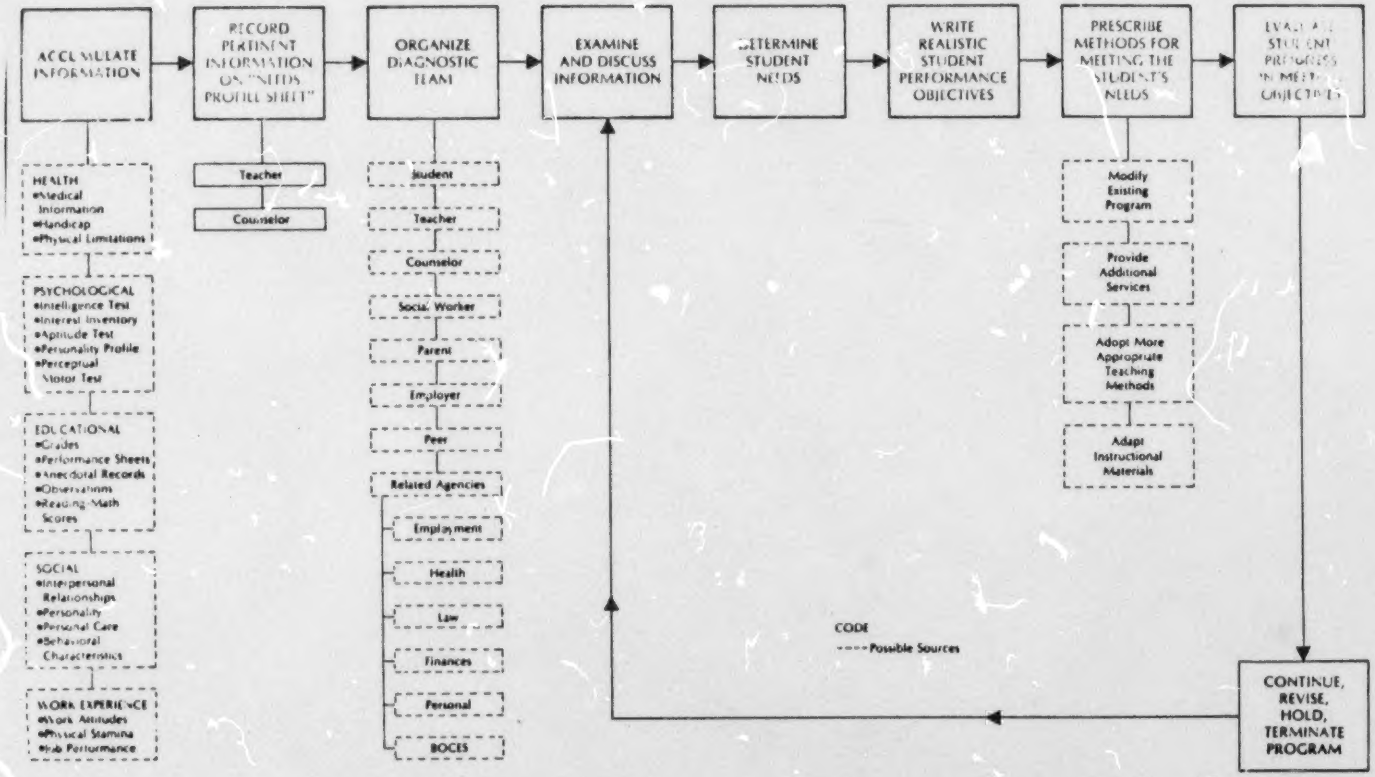
Tindall, et al, MODIFYING REGULAR PROGRAMS AND DEVELOPING CURRICULUM MATERIALS FOR THE VOCATIONAL EDUCATION OF THE HANDICAPPED. Madison, Wisconsin: Wisconsin Vocational Studies Center, University of Wisconsin, 1979, p. 14.

APPENDIX D. MARYLAND FLOWCHART OF VOCATIONAL EVALUATION ACTIVITIES


REFERRAL
INTAKE
ORIENTATION
CAREER COUNSELING
TESTING
WORK SAMPLING
BEHAVIORAL OBSERVATIONS
JOB TRYOUTS VO-TECH TRYOUT
FEEDBACK TO STUDENTS
CONFERENCES COUNSELORS STUDENT PARENTS ETC.
RECOMMENDATIONS IMPLEMENTATION DESIRED CHANGES EFFECTED
FOLLOW UP

[*] Maryland Department of Education. VOCATIONAL EVALUATION IN MARYLAND PUBLIC SCHOOLS: A MODEL GUIDE FOR STUDENT ASSESSMENT. Division of Vocational/Technical Education, 1977, p. 22.

APPENDIX E. ASSESSING STUDENT NEEDS IN COLORADO


ACCUMULATE INFORMATION
RECORD PERTINENT INFORMATION ON "NEEDS PROFILE SHEET"
ORGANIZE DIAGNOSTIC TEAM
EXAMINE AND DISCUSS INFORMATION
DETERMINE STUDENT NEEDS
WRITE REALISTIC STUDENT PERFORMANCE OBJECTIVES
PRESCRIBE METHODS FOR MEETING THE STUDENT'S NEEDS
EVALUATE STUDENT PROGRESS IN MEETING OBJECTIVES
HEALTH
•Medical Information
•Handicap
•Physical Limitations
PSYCHOLOGICAL
•Intelligence Test
•Interest Inventory
•Aptitude Test
•Personality Profile
•Perceptual Motor Test
EDUCATIONAL
•Grades
•Performance Sheets
•Anecdotal Records
•Observations
•Reading-Math Scores
SOCIAL
•Interpersonal Relationships
•Personality
•Personal Care
•Behavioral Characteristics
WORK EXPERIENCE
•Work Attitudes
•Physical Stamina
•Job Performance
Teacher
Counselor
Student
Teacher
Counselor
Social Worker
Parent
Employer
Peer
Related Agencies
Employment
Health
Law
Finances
Personal
BOCES
Modify Existing Program
Provide Additional Services
Adopt More Appropriate Teaching Methods
Adapt Instructional Materials
CODE
----Possible Sources
CONTINUE, REVISE, HOLD, TERMINATE PROGRAM

---

*Altfest, Myra, Editor. VOCATIONAL EDUCATION FOR STUDENTS WITH SPECIAL NEEDS: A TEACHER'S HANDBOOK. Department of Vocational Education, Coloardo State University (Fort Collins) and Colorado State Board for Community Colleges and Occupational Education, 1975, p. 20-21.

APPENDIX F

B. Goodwill Industries of South Florida, Inc., Re-Education Program

Behavioral Assessment Procedures

Source

The following items are from the Burk's Behavior Rating Scales adapted to the workshop situation in order to prompt specific data during the work evaluation.

Procedure

Enter in the "recommendation for the behavioral prescription" only those items on the "behavioral assessment checklist" rated one (1) or two (2) on the rating guide of the "work evaluation report"; i.e., "completely inadequate or below average vocationally."

1. Behaviors and performances receiving a rating of one (1) are acceptable only in a highly structured, supportive, noncompetitive work setting such as a sheltered workshop.
2. Behaviors and performances receiving a rating of two (2) suggest that the participant is achieving below the level of competitive employment. However, there are indications that with additional treatment and/or training, he may be able to function with such a work setting.

Behavioral Assessment Checklist

A. Personal appearance
   1. Grooming
   2. Work attire

B. Physical assets and liabilities
   1. Poor physical strength
      a. Avoids physical effort.
      b. Gets hurt in physical work.
      c. Gets tired quickly.
      d. Will not do rough work.
      e. Appears physically lethargic.
      f. Slow.
   2. Poor coordination
      a. Has trouble holding onto things.
      b. Shows poor coordination in large muscle activity.
      c. Handwriting is poor.
      d. Accidentally runs into people and objects.
      e. Drawings and paintings are messy.
   3. Obesity

C. Mental abilities
   1. Poor academics
      a. Shows poor reading.
      b. Shows poor spelling.
      c. Follows academic directions poorly.
      d. Assignments are poorly written.
   2. Poor intellectuality
      a. Does not ask questions.
      b. Perseverates, cannot shift responses.
      c. Gives inappropriate responses.
      d. Does not show imagination.
      e. Has trouble remembering things.
      f. Shows poor vocabulary.
      g. Does not show common sense.
   3. Poor attention
      a. Shows erratic, flighty, or scattered behavior.
      b. Is easily distracted, lacks continuity of effort and perseverance.
      c. Attention span not increased by punishment or reward.
      d. Attention span is short.
      e. Cannot finish what he is doing; jumps to something else.
   4. Poor reality contact
      a. Tells bizarre stories.
      b. Uses unintelligible language.
      c. Shows daydreaming.
      d. Shows tics and grimaces without apparent reason.
      f. Rotates or rocks his body.
      g. Makes weird drawings.
      h. Is unaware of what is going on around him.

D. Emotional stability
   1. Excessive anxiety
      a. Shows many fears.
      b. Appears tense.
      c. Worries too much.
      d. Flushes easily.
      e. Appears nervous.
   2. Poor impulse control
      a. Becomes overexcited easily.
      b. Is hyperactive and restless.
      c. Shows explosive and unpredictable behavior.
      d. Is impulsive.
      e. Cannot control self (will speak out or jump out of seat).
   3. Poor anger control
      a. Becomes angry quickly.
      b. Becomes angry if asked to do something.
      c. Is quickly frustrated and loses emotional control.
      d. Explodes under stress.
      e. Flares up if teased or pushed.
   4. Excessive self-blame
      a. Questions indicate a worry about the future.
      b. Upset if makes a mistake.
      c. Shows overremorse for doing wrong.
      d. Is upset if things do not turn out perfect.
      e. Blames himself if things go wrong.

5. Excessive resistance
a. Is stubborn and uncooperative.
b. Is rebellious if disciplined.
c. Denies responsibility for own actions.
d. Does things his own way.
e. Will not take suggestions from others.
6. Excessive dependency
a. Is dependent on others to lead him around.
b. Is overobedient.
c. Is easily led.
d. Wants others to do things for him.
e. Seeks constant praise.

7. Excessive sense of persecution
a. Maintains others pick on him.
b. Complains he never gets his fair share of things.
c. Will not forgive others.
d. Accuses others of things they actually did not do.
e. Complains others do not like him.

E. Interpersonal Relationships
1. Poor sense of identity
a. Acts as nonconformist.
b. Wears unusual clothing styles.
c. Associates with loners.
d. Rejects classmates in hostile manner.
e. "Style" of behaving deliberately different from most.
2. Excessive withdrawal
a. Is difficult to get to know.
b. Shows little feeling when others are upset.
c. Withdraws quickly from group activities; prefers to work by self.
d. Is shy.
e. Does not show feelings.
f. Appears disinterested in work of others.
3. Poor social conformity
a. Displays a "don't care" attitude; does what he wants.
b. Tells falsehoods.
c. Does not follow through on a promise.
d. Takes things which do not belong to him.
e. Shows little respect for authority.
f. Is tardy.
g. Is involved in undesirable escapades.
h. Is truant.
4. Excessive aggressiveness
a. Laughs when others are in trouble.
b. Hits or pushes others.
c. Wants to boss others.
d. Is sarcastic.
e. Teases others.
f. Plays tricks on other children.
5. Excessive sexuality
a. Employs much sex talk.
b. Reads questionable sexual material.
c. Acts boy crazy or girl crazy.
d. Wears sexually provocative clothing.
e. Studies pictures of pornographic nature.
f. Shows exclusive interest in opposite sex.

F. Work habits
1. Poor ego strength
a. Depreciates and distrusts own abilities.
b. Is easily satisfied with inferior performance.
c. Avoids competition.
d. Is easily frustrated and gives up passively.
e. Acts silly.
f. Shows little self-confidence.
g. Plays the clown.

2. Excessive suffering
a. Sulks.
b. Appears unhappy.
c. Seems to welcome punishment.
d. Deliberately puts himself in position of being criticized.
e. Gives picture of "poor me."
f. Feelings easily hurt.
g. Appears depressed.

II. Ratings and Behaviors in Job Sampling

A. Learning and comprehension
1. Responses to instruction
a. Requires minimal instruction for task completion.
b. Requires moderate instruction and completes task.
c. Requires extensive instruction for task completion.
d. Does not complete task with extensive instruction.
2. "On-task" behavior
a. Rarely on task.
b. Fluctuates from on task to off task.
c. More on task than off task.
d. Stays on task.
3. Flexibility—rotation of tasks
a. Adjusts well to new tasks.
b. Adjusts to new tasks with minor difficulties.
c. Adjusts to new tasks with major difficulties.
d. Cannot adjust to new tasks.

B. Performance characteristics
1. Frustration and tolerance
a. Attends to job regardless of obstacles.
b. Attends to job with evident frustration.
c. Has difficulty attending to job when confronted with obstacles.
d. Cannot complete job when confronted with obstacles.
2. Consistency of effort
a. Shows consistent work behavior.
b. Shows moderately consistent work behavior.
c. Work behavior was erratic.
d. Work behavior was unstable.

C. Work attitudes
1. Adaptation
a. Upon being familiarized with shop rules, the client adjusts with little delay.
b. Upon being familiarized with shop rules, the client adjusts with some delay.
c. Client has difficulty adjusting to shop rules after being familiarized.
d. Client cannot adjust to shop rules though familiar with same.
2. Motivation toward work
a. Demonstrates initiative in finding tasks to perform.
b. Client will frequently seek tasks to perform.
c. Client rarely seeks tasks to perform.
d. Client is content to sit idle.

3. Stress responses
   - a. Works best under little or no stress.
   - b. Work responses improved by occasional stress.
   - c. Work responses best under constant moderate stress.
   - d. Work responses best under constant strong stress.
4. Punctuality
   - a. Institutes work behavior immediately.
   - b. Seldom delays institution of work behaviors.
   - c. Frequently late in instituting work behaviors.
   - d. Consistently late in instituting work behaviors.
5. On-task work behaviors
   - a. Stays on task while working.
   - b. Stays on task more than off task while working.
   - c. Stays on task one-half of the time.
   - d. Stays off task most of the time.

D. Interpersonal relations
1. Reaction to supervision
   - a. Works best with little or no supervision.
   - b. Works best with limited, supportive supervision.
   - c. Works best with firm supervision.
   - d. Cannot work without supervision.
2. Peer relations
   - a. Achieves group acceptance quickly and easily.
   - b. Achieves group acceptance after a short period of time.
   - c. Achieves group acceptance to a limited degree.
   - d. Does not achieve group acceptance.

E. Appearance
1. Grooming
   - a. Consistently neat and clean.
   - b. Needs periodic reminders about dress and/or personal care.
   - c. Careless about personal cleanliness to the point of giving offense.
   - d. Consistently unkempt and disordered—makes little or no effort to meet standards of typical group.

Form For Recording and Controlling Behaviors

Program ______________________ Name ______________________

Work station ______________________ Dates ______________________

		Mon.	Tues.	Wed.	Thurs.	Fri.	Defining behavioral goals
1	L						
	P						
2	L						
	P						
3	L						
	P						
4	L						
	P						
Total of P							

P = Count of actual behavior or pieces.
L = Limit (estimate) of inappropriate behavior or pieces which determine reward or not.
V = Reward granted.
X = Reward denied.
1-2-3-4 = Quarter of the working day (divided by a.m. break, lunch, and p.m. break)

APPENDIX G. PUBLISHERS OF PAPER-AND-PENCIL VOCATIONAL APTITUDE TESTS

Bobbs-Merrill Education Publishing Co.
4300 West 62nd Street
P. O. Box 7080
Indianapolis, IN 46206

Aptitude Tests for Occupations
Detroit Clerical Aptitudes Exam

Cambridge, The Basic Skills Company
Department PAYNES
888 Seventh Avenue
New York, NY 10019

PAYNES--Program for Assessing Youth Employment Skills

CTB/McGraw-Hill
Del Monte Research Park
Monterey, CA 93940

TABE--Tests of Adult Basic Education
Career Maturity Inventory
Planning Career Goals--PCB
SPIB--Social Prevocational Information Battery

Hester Evaluation Systems
Business and Industry Resource Specialists
120 South Ashland Blvd.
Chicago, IL 60607

Hester Evaluation System

Lawrence McCarron
Department of Pscyhology
Indiana State University
Terre Haute, IN 47809

McCarron-Dial Work Evaluation System

Charles E. Merrill Publishing Company
1300 Alum Creek Drive
Columbus, OH 43216

Purdue Perceptual Motor Survey

The Psychological Corporation
757 Third Avenue
New York, NY 10017

Differential Aptitude Tests
Ohio Vocational Interest Survey

Psychological Services, Inc.
Suite 600
4311 Wilshire Blvd.
Los Angeles, CA 90010

Crissey Dexterity Test

Psychometric Techniques Associates
710 Chatham Center Office Bldg.
Pittsburgh, PA 15219

Tapping Test

Riverside Publishing Company
1919 South Highland Avenue
Lombard, IL 60148

VIESA--Vocational Interest, Experience, and Skill Assessment

Stanford University Press
Stanford, CA 94305

Strong Vocational Interest Blank

Science Research Associates, Inc.
155 North Wacker Drive
Chicago, IL 60606

Holland Vocational Preference Inventory
Kuder Form A Personal Preference Survey
Kuder Form C Vocational Preference Record
Kuder Form E General Interest Survey
Kuder Form DD Occupational Interest Survey
Purdue Pegboard
SRA Coping Skills
Short Occupational Knowledge Tests (SOKT)
SRA Test of Mechanical Concepts

U. S. Government Printing Office
Washington, D. C.

GATB--General Aptitude Test Battery

Note A: Paper-and-pencil vocational aptitude tests may be incorporated in some of the work sample systems identified in Appendix H.

Note B: Other test may be located through the reference library, namely:

Buros, Oscar K., Editor. VOCATIONAL TESTS AND REVIEWS. Highland, New Jersey: The Gryphon Press, 1975.

APPENDIX H

PUBLISHERS OF WORK SAMPLE TESTS AND/OR SYSTEMS

COATS

NAME

COATS (Comprehensive Occupational Assessment and Training System)

This system consists of four components, with an audiovisual format in each. They may be used separately but represent a more comprehensive picture if all components are utilized.

COMPONENTS

Living Skills

This component measures functional competencies in the skills of reading, writing, computing, problem solving, speaking and listening in conjunction with the knowledge areas of consumer economics, health, government and law, occupational knowledge, and community resources. Computerized results give a profile of the individual's functional literacy (commonly called "survival skills") in the adult world. Results may be used for prescribing instruction for improvement.

Population: 13-19 years old and adults

No. of Items: 250

Administration: May be administered individually or as a group. No time limit; not necessary to complete entire assessment at one time

Norms: Publisher provides reliability values, norms based on nationally representative sample and given in terms of means and standard deviations by skill area, knowledge area, and total score.

Comments: Materials include six audiovisual cartridges, consumable response booklets student learning contracts, various progress monitoring forms, and an interpretation folder.

Results are computerized and appear as profiles.

Job Matching

The individual indicates preferences (dislike, neutral, likes) and experience (not experienced, some experience, experienced) in relation to activities in concrete, social, and information categories. Results are then matched to profiles for 24 major occupational clusters; they may be matched to local skill training classes and the local community requirements.

Population: Secondary school age, grades 9-12
Clients of CETA and other manpower and labor programs
Clients of rehabilitation programs
Inmates in correctional institutions
Students in postsecondary and adult education programs
Job applicants, private or public sectors

No. of Items: 240 preference questions
240 experience questions

Administration: May be administered on a group or individual basis. No time limit; but the following times serve as a guide for scheduling:

Preference: 60 minutes, with 90 minutes for the handicapped
Experience: 60 minutes, with 90 minutes for the handicapped

Norms: Reliability and predictive validity figures are provided by the publisher. The test is not a normed test as the resulting profiles are compared to occupational cluster profiles rather than other individuals. The content was judged to be ethnically and sexually neutral (non-discriminatory) by one research study.

Comments: Materials include 10 audiovisual cartridges, consumable response booklets, Instructor's Guide, a Cluster and Systems Match Manual, and an interpretation folder. In addition, a 5-cartridge option to assess the capabilities of the physically handicapped is also available.

This test is not recommended as a sole determiner for placement into specific training programs.

Employability Attitudes

This component assesses the individual's attitudes and behaviors in 13 job-seeking and 23 job-keeping areas. The results are given in relation to what employers expect these attitudes and behaviors to be.

Population: Same as for Job Matching given above

No. of Items: 360 in 36 different attitudal categories

Administration: May be administered on a group or an individual basis. No time limit, but the following times serve as a guide for scheduling:

Job Seeking: 100 minutes with 150 minutes for handicapped
Job Keeping: 200 minutes with 300 minutes for handicapped

Norms: Does not produce arbitrary cutoff scores; results should be interpreted as "signals" that the individual's perceptions are higher/lower than employers' expectations. Publisher provides convergent validity, divergent validity, and reliability scores.

Comments: The Job Seeking and the Job Keeping components may be given together or as separate parts.

Materials include 2 job seeking and 4 job keeping audiovisual cartridges, consumable response booklets, Learning Activity Packages, an Instructor's Guide, a student learning contract and progress monitoring form, and an interpretation folder.

The test does not produce cutoff scores.

Work Samples

The Work Samples approximate the actual job environment and evaluate a complete range of work activities--physical movements, mental functioning, performance standards, operations, and materials and equipment. The objective of each one is to assess each person's interest, performance capability, and general behavior in various job situations.

There are 25 Work Samples; each one is a self-contained "hands on" assessment module related to a specific type of occupation and keyed to specific DICTIONARY OF OCCUPATIONS TITLES job titles and codes and the USOE Occupational Clusters. The 25 Work Samples are:

- Drafting
- Clerical/Office
- Metal Construction
- Sales
- Wood Construction
- Food Preparation
- Medical Services
- Travel Services
- Barbering/Cosmetology
- Small Engines
- Police Science
- Masonry
- Electrical
- Electronics
- Automotive
- Commercial Art
- Nutrition
- Bookkeeping
- Fire Science
- Real Estate
- Extraction Technology
- Clothing and Textiles
- Communication Services
- Refrigeration
- Solar Technology

Each Work Sample presents detailed information about salaries and wages, work conditions, and employment outlooks associated with that particular occupational area. Reading ability is required only when the job task itself demands reading.

The instructor or evaluator must observe the individual and render judgments about the individual's work quality, work rate, and learning characteristics, using standard instructions and criteria.

Population: Same as for Job Matching given previously. Also, may be used for career exploration program with junior high level students

No. of Items: Completion of tasks

Administration: Should be administered on an individual basis. Each sample occupies a 4 by 4 area and are best set up in individual carrels. Audiovisual equipment is needed. An instructor or evaluator must be present to observe and may observe 8-10 work stations at one time. The instructor should supervise less stations if the client is handicapped and needs more instruction or help.

Completion times are recorded for each work sample (with handicapped persons usually taking more time) but the time is not limited.

Norms: Job tasks were validated as representative of job families and specific occupations based on DICTIONARY OF OCCUPATIONAL TITLES, Department of Labor procedures, and USOE career clusters.

Work performance norms are provided for each work sample; time norms are also provided. Instructor's observations guide decisions and interpretation of results.

Comments: The tests do not produce cutoff scores. An individual may complete as many work samples as he/she wants or has time for.

PUBLISHER For more information, contact:

PREP INC.
1575 Parkway Avenue
Trenton, NJ 08628

Freeman Educational Division
Suite 101
27439 Holiday Lane
Perrysburg, OH 43551

HESTER

NAME HESTER EVALUATION SYSTEM

This system consists of a series of 20-27 tests, both paper-and-pencil variety and testing apparatus type, to assess vocational abilities and then relate the data to specific jobs in a broad range of industries and occupational fields.

COMPONENTS

Testing

Three types are given: (1) Unilateral motor to assess finger dexterity, wrist-finger speed, and arm-hand steadiness; (2) Bilateral motor to assess manual dexterity, two-arm coordination, two-hand coordination, hand-tool desterity, multi-limb coordination, machine feeding; (3) Perceptual to assess perceptual accuracy, perceptual speed, spatial perception, and depth perception.

Computerized Analysis

After the individual has completed the tests and provided some basic background information, the computer analyzes the results and prints out three types of information:

a. Level of ability for the following:

Finger dexterity
Wrist-finger speed
Arm-hand steadiness
Two-arm coordination
Two-hand coordination
Hand-tool dexterity
Multi-limb coordination
Machine feeding
Perceptual speed
Spatial Perception
Depth perception
Aiming
Reaction time
Fine perception motor coordination
Visual motor reversal
Abstract reasoning
Verbal reasoning
Numerical reasoning
Decision speed
Response orientation
Oral directions

Reading grade level
Arithmetic grade level
Hand Strength
Lifting Ability

b. Data-People-Things Evaluations

The "ability" data is integrated with other data and then compared to the traits corresponding to the Data-People-Things levels found in the DICTIONARY OF OCCUPATIONAL TITLES (currently being updated for the recent revision).

c. Listing of Specific Jobs

A list of specific jobs, including DOT number, industry, physical limits, work conditions, educational requirements and special vocational programs are provided based on the computerized data from a and b.

Population: High school guidance programs
Rehabilitation facilities
Sheltered workshops
Community colleges
Correctional institutions

Administration: Entire series of tests can be completed in three to five hours.

Norms: Unknown for system; however, the system uses many well-recognized tests. Contact publisher for specific information.

Comments: System may be used with gifted, normal, or mentally handicapped. Physical limitations are included in the computer evaluation; therefore, the system may be used with the physically handicapped. Modifications are being made in the system now (according to publisher) to accommodate the blind and partially sighted.

Tests may be administered to both non-literate and non-English-speaking people.

PUBLISHER Hester Evaluation Systems
Business and Industry Resources Specialists
120 South Ashland Blvd.
Chicago, IL 60607

J.E.V.S.

NAME J.E.V.S. WORK SAMPLES

Primarily used for special needs populations. The JEVS Work Samples are hands-on activities designed to reflect the primary skills inherent in actual jobs.

They provide the vocational counselor with more than an explanation of vocational possibilities. They assess interest, behavior, and performance, relating these factors to work capabilities.

COMPONENTS 28 work samples (contact publisher for list)

Measures the student/clients in three areas: (1) vocational skills such as dexterities, perceptual abilities, direction following abilities, and numerical abilities; (2) work-related behaviors such as punctuality, attention span, and supervisory and co-worker interaction, and (3) interests such as a preference for working with tools, clerical detail, routine work, or problem-solving work.

Work Samples are arranged in a hierarchy of increasing complexity. Results are directly related to the worker trait groups in the DICTIONARY OF OCCUPATIONAL TITLES.

Population: Special needs

No. of Items: 28 work samples (selection made for the individual)

Norms: Based on more than 1,100 individuals. Contact publisher.

Administration: Intended to be administered in 5 to 7 working days, in a simulated work setting, with a maximum of 5 students to each evaluator.

Comments: Publsiher offers a one-week training session for the JEVS evaluator.

PUBLISHER VOCATIONAL RESEARCH INSTITUTE--J.E.V.S.
1700 Sansom Street
Philadelphia, PA 19103

Also publish two other work sample systems described elsewhere in this section: VIEWS and VITAS

MICRO-TOWER

NAME MICRO-TOWER

These work samples utilize a wide range of equipment and forms. The five major aptitude clusters used here are intercorrelated with those used in the GATB: verbal, numerical, motor, perceptual, and perceptual-motor.

These major aptitude areas are interwoven with the work samples.

COMPONENTS 13 work samples (brief description of each follows)

Want Ads Comprehension--assesses the ability to read and understand English; can be used as a brief language screening device. Includes a series of "want ads" along with a list of standard abbreviations used by newspapers. Takes 45 minutes (15 minutes' practice; 30 minutes for the evaluation).

Message Taking--requires an understanding of spoken English and the ability to write brief messages; involves some concentration and short-term memory. Takes one hour (30 minutes' practice; 30 minutes for evaluation).

Payroll Computation--assesses the four basic arithmetic skills--addition, subtraction, multiplication, and division using whole numbers and decimals. Takes 70 minutes (39 minutes' practice; 31 minutes for evaluation).

Making Change--assesses the ability to accurately count money and make change after being taught how to make change. Takes 45 minutes (33 minutes' practice; 12 minutes for evaluation).

Mail Sorting--measures perceptual-motor skills in the sorting of envelopes into appropriate mailbox slots. Takes 45 minutes (40 minutes' practice; 5 minutes for evaluation).

Filing--tests clerical perception, requiring some limited motor skills; uses a series of small cards for filing in a file box alphabetically, numerically, and some combinations. Takes one hour (35 minutes' practice; 25 minutes for evaluation).

ZIP Coding--assesses clerical and perceptual skills, particularly those needed when using reference books. Takes 82 minutes (45 minutes' practice; 37 minutes for evaluation).

Record Checking--is primarily a clerical checking and copying task and involves clerical-perceptual skills; involves using a computer print-out of an inventory list from a shoe store and another list in order to compare for discrepancies. Takes one hour (45 minutes' practice; 15 minutes for evaluation).

Bottle Capping and Packing--assesses manual dexterity; consists of screwing metal caps on plastic bottles and then packing them in cartons. Takes 20 minutes (17 1/2 minutes' practice; 2 1/2 minutes for evaluation).

Lamp Assembly--assesses the ability to use hand tools for performing relatively fine manual assembly tasks. During the first section, instructions are given and practice is provided in the use of the hand tools; in the second section the person assesmbles a working lamp. Takes 2 hours, 40 minutes (2 hours, 31 minutes' practice; 9 minutes for evaluation).

Electronic Connector Assembly--is designed to assess finger dexterity; involves placing metal pins and spring clips into plastic inserts--a three-part task. Takes 45 minutes (40 minutes' practice; 5 minutes evaluation).

Blueprint Reading--is primarily a spatial perception task. Takes 45 minutes (30 minutes' practice; 15 minutes for evaluation).

Graphics Illustration--assesses spatial perception and involves some manual and finger dexterity and motor coordination as well; uses three tools--T-square, triangle, and compass. Takes 1 hour, 45 minutes (45 minutes' practice; 45 minutes for evaluation).

Population: Physically disabled
Brain damaged
Educable mentally retarded
Adults--male and female
Spanish-speaking
Other diverse groups*

Administration: Groups (all persons being tested are all doing the same task at the same time in close proximity, usually round a table or set of tables.

Norms: Provided for many diverse groups--contact the publisher.

Comments: The battery also includes sections on the student's preferences (How did you like this work sample? Would you enjoy doing this kind of work on a job? Learning how to do this work was hard? easy? On this work sample I think I did poorly? well?)

Behavioral observations about the student's general and work behaviors are made by the evaluator.

The results of the work samples, the worker preferences, and the behavioral observations are then matched to the data in the DICTIONARY OF OCCUPATIONAL TITLES.

PUBLISHER Micro-TOWER Institutional Services
ICD Rehabilitation and Research Center
340 East 24th Street
New York, NY 10010

---

*Publisher is currently working on and may have available norms for disadvantaged, secondary school levels, and handicapped/special needs populations. Contact the publisher for information.

TAP

NAME TAP--Talent Assessment Program

This battery of action tests offers information related to functional characteristics applicable to training and work. The "hands-on" action in the tests makes them independent of reading skills. These tests measure: (1) dexterity, (2) discrimination capacities, (3) visualization strengths, (4) retention characteristics, and (5) ability to visualize flow paths.

COMPONENTS The program consists of ten assessments:

Structural and mechanical visualization
Discrimination by size and shape of objects
Discrimination by color
Discrimination by touch--tactile
Dexterity without tools--small
Dexterity without tools--large
Fine dexterity--with tools
Dexterity with large tools
Visualizing flow-paths
Retention of structural and mechanical detail

Population: Ages 14 or older
No reading required

No. of Items: 10 assessments

Administration: Requires approximately 2 hours. Several people may be tested at the same time

Comments: Publisher states that these assessments measure native capacities rather than interest exploration as many of the other work sample systems do.

These assessments are specifically designed for work in trade, industrial, technical, and professional technical lines.

PUBLISHER

MDC Dept. of Rehabilitation and Manpower Services
School of Education
University of Wisconsin--Stout
Menomonie, WI 54751

VALPAR

NAME VALPAR

This system provides a standardized way to measure the vocational aptitudes--and especially physical capabilities--of the handicapped/disabled person as well as the non-disabled person. Each of the 16 assessment units introduces those job factors that individuals would encounter in a real work situation and assesses their degree of ability to perform required tasks and evaluates job-related motor and thought process skills related to the job functions.

COMPONENTS Work Samples (16) that include the following:

Small Tools (Mechanical)--measures a person's ability to understand and work with small hand tools in assembling and disassembling parts through a small opening in a special box. Takes 90 minutes or longer to complete. Special kit is available for administering to visually impaired or blind.

Size Discrimination--measures a person's ability to visually discriminate sizes while screwing the correct size nut on a series of bolts; involves both assembly and disassembly. May be used with persons having visual impairments, including the blind.

Numerical Sorting--measures the ability of a person to sort, file, and categorize objects by a numerical code. Person transfers chips from one board to another and back according to numbers. (A specialized Braille kit is currently being developed according to publisher.)

Upper Extremity Range of Motion--measures the range of motion and work tolerances of the person in relation to the upper torso (shoulders, upper arms, forearms, elbows, wrists, hands, and fingers). Person works through an opening with both hands, putting two sizes of nuts (different colors) on each of five panels. One-handed person may do part; may be used with visually impaired or blind if adequate time is alloted for the person to become oriented to the work sample.

Clerical Comprehension and Aptitude--measures a person's ability to perform a variety of clerical tasks as well as measuring ability to learn these tasks. This unit involves telephone answering, alphabetical filing, bookkeeping, and typing. May be used with all disabled although there are some restrictions for the visually impaired where sight is needed for completion.

Independent Problem Solving--measures a person's ability to perform work tasks that require a visual comparison of colored shapes and making decisions in matching printed colored, geometric shapes with master cards. Is not recommended for those with severe visual impairments.

Multi-Level Sorting--measures a person's ability to make decision while performing working tasks requiring physical manipulation and three categories of visual discrimination. Task is to sort 168 coded chips into slots with four levels of coding built in. Score is a time/error score and relates to the level of supervision needed while performing a specific job. Special administration manual is needed for use with the visually impaired or blind.

Simulated Assembly--measures a person's ability to work at an assembly task requiring repetitive physical manipulation and evaluates the use of upper extremities. Task involves a three-step assembly of pin and washer to a cap on the assembly board that rotates during the process. May be used for those with visual impairments; is often used to determine the standing and sitting tolerances for persons entering or returning to the labor force.

Whole Body Range of Motion--consists of a two-part adjustable metal frame with various panels. Person must attach nuts to various parts of the frame or its panels while working overhead, reaching around panels, working at knee level, and reaching in various other ways. This sample measures the agility a person has in the gross body movements of the trunk, arms, hands, legs, and fingers. May be used with visually impaired persons.

Tri-Level Measurement--measures a person's ability to perform very simple to very precise inspector and measurement tasks using a ruler, micrometer, and vernier caliper while inspecting 61 machined parts.

Eye-Hand-Foot Coordination--measures a person's ability to use his/her eyes, hands, and feet simultaneously and in a coordinated manner. The person maneuvers nine balls, one at a time, through a 13-point maze without dropping the balls through the holes; the person tilts the box left or right or up and down using feet and hands. Is not recommended for those with visual handicaps.

Soldering and Inspection (Electronic)--measures a person's ability to acquire and apply basic skills necessary to perform soldering tasks varying in in levels of difficulty; involves eye/hand coordination, dexterity, ability to measure accurately, ability to follow instructions, visual acuity, frustration tolerances, attentiveness, and judgment. Is not recommended for those with severe visual handicaps or with severe coordination problems.

Money Handling--measures individual skill in dealing with monetary concepts ranging from basic money recognition to consumer economics. Person identifies coins, makes change, and answers more difficult questions on a paper-and-pencil test. Special administration directions are currently being developed for use with visually impaired or blind.

Integrated Peer Performance--a three-level work surface for assembling facilitates worker interaction during the task. The assembly board rotates and each worker must perform his/her portion of the task. Emphasis is placed on each person's ability to interact with both peers and supervisors. Is not recommended for those with severe visual impairments.

Electrical Circuitry and Print Reading--measures the person's ability to understand and apply principles and functions of electrical circuits. The person tests each circuit, records malfunctions, and repairs some nonfunctioning circuits. Is not recommended for persons with severe vicual handicaps or with severe coordination problems.

Drafting--measures the individual's potential to compete in entry level position requiring basic drafting skills; it includes simple measuring, line perception exercises, determining scaled dimension, drawing schematics and diagrams, freehand drawing, and interpreting blueprints.

Population:
- Special disability groups
- Non-handicapped persons
- Methods Time Measurement of workers
- Secondary school age group
- Vocational/technical school groups
- CETA
- Correctional facilities groups
- Special Education
- Rehabilitation workshops

No. of Items: 16 work samples

Administration: Takes varying amountsof time to complete; some are timed and some are not. May be used both ways, depending on purpose.

Practice sessions are allowed. Retesting may aid in developing the performance curve for an individual.

Comments: These tests tend to measure a person's physical capacities in a non-medical manner more than some of the other work sample systems.

Publisher has already or is in the process of developing administrative procedures or modifications in each assessment unit for the visually handicapped, hearing impaired, and blind.

Special Note: VALPAR has designed a Mobile Assessment Career Center which may be of interest to smaller schools within a specific geographic area.

PUBLISHER VALPAR Corporation
3801 East 34th Street, Suite 105
Tucson, AZ 85713

Also available:

Pre-Vocational Readiness Battery (meeting the assessment challenge of the Special Needs student)--Work Sample 17

VOICE--VALPAR Occupational Interest Choice Evaluation--a self-assessment career choice program

VES

NAME VES--Vocational Assessment System (by Singer)

This system provides both a vocational assessment and an occupational exploration. Through the use of work samples, it identifies the vocational abilities, interests and work behavior of individuals as they explore the world of work. VES creates a simulated work setting with which the individual can readily identify and experience job tasks in a non-competitive atmosphere.

COMPONENTS Includes assessments of work behavior and performance.

Includes more than 20 work stations, such as:

- Sample making
- Bench assembly
- Drafting
- Electrical wiring
- Plumbing and pipe fitting
- Woodworking
- Refrigeration and air conditioning
- Welding
- Sales processing
- Needle trades
- Masonry
- Sheet metal working
- Cooking and baking
- Small engine service
- Medical service
- Cosmetology
- Data calculation and recording
- Soil testing
- Photo lab technician
- Production machine operating
- Household and industrial wiring
- Filing, shipping and receiving
- Packaging and materials handling
- Electronic assembly

Population:
- Vocational rehabilitation
- Junior high through two-year post-secondary
- Manpower centers
- Technical schools
- Sheltered workshops
- Correctional facilities
- Disadvantaged/advantaged
- Special education programs

No. of Items: 20+ work stations

Administration: Self-administered through programmed text and filmstrip/tape cassettes while evaluator is free to observe.

Norms: Norms provided by publisher or will be developed locally. Predictive and face validity scores are available.

Comments: The system uses work and work-related activities as the means of assessment. It assesses the individual's abilities, aptitudes, attitudes, interest and tolerance for specific job areas. The results are related to the DOT and the OE Career Clusters.

The work station assessments alleviate reading and writing requirements and yet covers a wide variety of skill levels, occupational areas, and types of jobs found in most local areas.

PUBLISHER
SINGER Education Division
Career Systems
80 Commerce Drive
Rochester, NY 14623

Other Programs
Also Available:

- Community Life Skills
- Interpersonal Life Skills
- Job Survival Skills
- Occupational Information Program

VIEWS

NAME VIEWS (Vocational Information and Evaluation Work Samples)

These work samples assess skills, interest, and work-related behavior and the results measure rate of learning, quality of work, and productivity.

These work samples are specifically developed for the mentally retarded.

COMPONENTS 16 work samples (contact publisher for list)

These work samples evaluate ability in four areas of work as defined in the DICTIONARY OF OCCUPATIONAL TITLES: (1) elemental--handling and feeding-offbearing; (2) clerical--routine checking and recording as well as sorting, inspecting, measuring and related; (3) machine--tending; and (4) crafts--manipulating.

Individualized training to a level of competency occurs before the assessment of performance. An industrial time standard (MOPADTS) is provided for each work sample to compare the student's productivity with that of an average practiced worker.

Population: Mentally retarded

No. of Items: 16 work samples

Administration: VIEWS may be re-administered to point up changes in learning and performance quality and rates.

Norms: Norms are provided for a wide range of mental retardation levels.

Comments: Numerical scores are given on rate of learning, quality of work, and productivity; also, summaries of objectively recorded behavioral observations can be made to assess such traits as attention span, ability to follow instructions, and frustration tolerance.

Publisher offers a one-week training session for the VIEWS evaluator.

PUBLISHER Vocational Research Institute
Jewish Employment and Vocational Service
1700 Sansom Street
Philadelphia, PA 19103

VITAS

NAME VITAS (Vocational Interest, Temperament, and Aptitude System)

These work samples include a battery of hands-on activities to be used in a simulated work environment. They assess work potential in terms of interest, temperament, and aptitudes and the results are then matched to worker trait groups in the DICTIONARY OF OCCUPATIONAL TITLES.

COMPONENTS 21 work samples

The VITAS process includes five steps: (1) orientation interview to acquaint student with evaluation, what he/she will be doing, the rules and regulations, and what is expected; (2) administration of work samples; (3) motivational group session conducted at the end of the first day of the evaluation to reduce anxiety; (4) vocational interest interview to give the student feedback on his/her performance; and (5) report writing in which the evaluator writes a report.

Population: Disadvantaged

No. of Items: 21 work samples

Administration: Takes 2 1/2 days with one evaluator and one aide working with five participants.

Norms: Provided by publisher.*

Data results in an assessment of vocational interests and temperaments and measures quality and speed of work.

Comments: Contact publisher for additional information.

PUBLISHER Vocational Research Institute
Jewish Employment and Vocational Service
1700 Sansom Street
Philadelphia, PA 19103

---

*Norms were originally developed using CETA participants. Publisher is currently developing norms on a vocational education special needs population.

WREST

NAME WIDE RANGE EMPLOYMENT SAMPLE TEST (WREST)

The WREST was developed in a workshop situation to observe economy of time and movement in human production. It is a test of "horizontal" achievement, (the capacity to do the routine operations involved in all jobs regardless of level). It can be used to confirm or reject a diagnosis of mental retardation; persons capable of achieving average or above scores on the WREST are NOT mentally retarded, even if their scores on "vertical" achievement or intelligence tests rate them as retarded. It is also a sample of manual and clerical job functions. (Excerpt from publisher's brochure about test)

COMPONENTS Work Samples in ten performances:

- Folding
- Stapling
- Packaging
- Measuring
- Assembling
- Tag stringing
- Pasting
- Collating
- Color or shade
- Pattern matching

Each tasks takes 7 to 15 minutes to complete each

Population: Ages 16 through 54; either sex

No. of Items: 10 work samples

Administration: Takes about 1 1/2 hours for individual to complete or 2 hours for small groups of three to six persons. May be re-administered at variable intervals to derive learning curves for individuals to distinguish between learning rates of the mentally retarded and those who test retarded but are not.

Norms: Scoring is done by hand for time and errors. Results are expressed in scaled scores for each subtest and added to obtain a total standard score.

Norms: Industrial norms based on 4,000 at all levels. Time and error norms provided.

Comments: Publisher states that the WREST is especially effective in these areas:

--Studies industrial efficiency of an individual in terms of time and production quality

--Checks individual's approach to a simulated job task

--Observes attitudes, efforts, production rate and emotional, motivational and social variables needed for job success

--Aids in counseling the disadvantaged, the chronic unemployed, the mentally maladjusted and retarded

--Trains disabled persons in specific skills for efficient production

--Materials are usable as constructive game/learning materials

PUBLISHER
JASTAK Associates, Inc.
1526 Gilpin Avenue
Wilmington, DE 19806

Also available:

WRAT	Wide Range Achievement Test
WRIOT	Wide Range Interest-Opinion Test
WRIPT	Wide Range Intelligence-Personality Test

APPENDIX I

Parts of the Occupational Definition*

Work is organized in a variety of ways. As a result of technological, economic and sociological influences, nearly every job in the economy is performed slightly differently from any other job. Every job is also similar to a number of other jobs.

In order to look at the millions of jobs in the U.S. economy in an organized way, the DOT groups jobs into "occupations" based on their similarities and defines the structure and content of all listed occupations. Occupational definitions are the result of comprehensive studies of how similar jobs are performed in establishments all over the nation and are composites of data collected from diverse sources. The term "occupation," as used in the DOT, refers to this collective description of a number of individual jobs performed, with minor variations, in many establishments.

There are six basic parts to an occupational definition. They present data about a job in a systematic fashion. The parts are listed below in the order in which they appear in every definition:

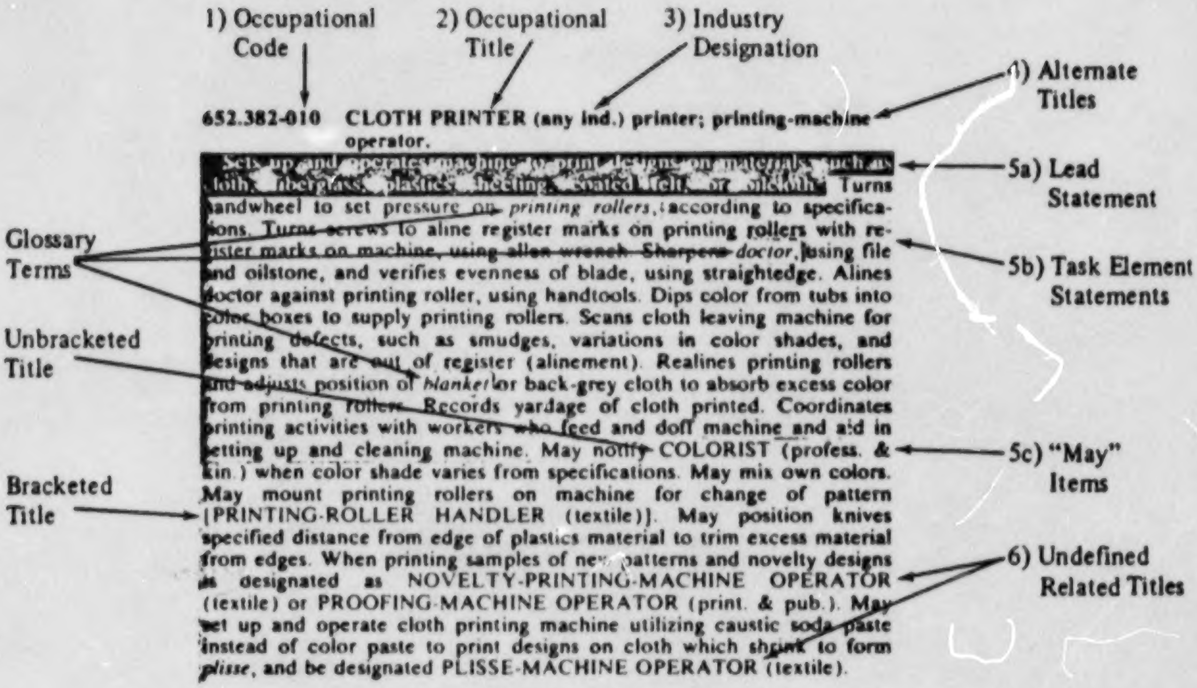
(1) The Occupational Code Number
(2) The Occupational Title
(3) The Industry Designation
(4) Alternate Titles (if any)
(5) The Body of the Definition
    (a) Lead statement
    (b) Task element statements
    (c) "May" items
(6) Undefined Related Titles (if any)

A typical DOT definition (with each of the six parts labeled) is analyzed on the following page:

---

*U. S. Department of Labor, Manpower Administration. DICTIONARY OF OCCUPATIONAL TITLES. Washington, D. C.: U. S. Government Printing Office, 1977, pp. xv-xxii.

PARTS OF A DOT DEFINITION



652.382-010 CLOTH PRINTER (any ind.) printer; printing-machine operator.

Sets up and operates machine to print designs on materials, such as cloth, fiberglass, plastics, sheeting, coated felt, or oilcloth. Turns handwheel to set pressure on *printing rollers*, according to specifications. Turns screws to aline register marks on printing rollers with register marks on machine, using allen wrench. Sharpens *doctor*, using file and oilstone, and verifies evenness of blade, using straightedge. Alines doctor against printing roller, using handtools. Dips color from tubs into color boxes to supply printing rollers. Scans cloth leaving machine for printing defects, such as smudges, variations in color shades, and designs that are out of register (alinement). Realines printing rollers and adjusts position of *blanket* or back-grey cloth to absorb excess color from printing rollers. Records yardage of cloth printed. Coordinates printing activities with workers who feed and doff machine and aid in setting up and cleaning machine. May notify COLORIST (profess. & kin.) when color shade varies from specifications. May mix own colors. May mount printing rollers on machine for change of pattern [PRINTING-ROLLER HANDLER (textile)]. May position knives specified distance from edge of plastics material to trim excess material from edges. When printing samples of new patterns and novelty designs is designated as NOVELTY-PRINTING-MACHINE OPERATOR (textile) or PROOFING-MACHINE OPERATOR (print. & pub.). May set up and operate cloth printing machine utilizing caustic soda paste instead of color paste to print designs on cloth which shrink to form *plisse*, and be designated PLISSE-MACHINE OPERATOR (textile).

(1) The Occupational Code Number

The first item in an occupational definition is the 9-digit occupational code (in the example, 652.382-010). In the DOT occupational classification system, each set of three digits in the 9-digit code number has a specific purpose or meaning. Together, they provide a unique identification code for a particular occupation which differentiates it from all others.

The *first three digits* identify a particular occupational group. All occupations are clustered into one of nine broad "categories" (first digit), such as professional, technical and managerial, or clerical and sales occupations. These categories break up into 82 occupationally specific "divisions" (first two digits), such as occupations in architecture and engineering within the professional category, or stenography, typing, filing and related occupations in the clerical and sales category. Divisions, in turn, separate into small, homogeneous "groups" (first three digits)—559 such groups are identified in the DOT. The nine primary occupational categories are listed below:

0/1 Professional, Technical, and Managerial Occupations
2 Clerical and Sales Occupations

3	Service Occupations
4	Agricultural, Fishery, Forestry, and Related Occupations
5	Processing Occupations
6	Machine Trades Occupations
7	Bench Work Occupations
8	Structural Work Occupations
9	Miscellaneous Occupations

In the example, the first digit (6) indicates that this particular occupation is found in the category, "Machine Trades Occupations."

The second digit refers to a division within the category. The divisions within the "Machines Trades Occupations" category are as follows:

60	Metal Machining Occupations
61	Metalworking Occupations, n.e.c.
62/63	Mechanics and Machinery Repairers
64	Paperworking Occupations
65	Printing Occupations
66	Wood Machining Occupations
67	Occupations in Machining Stone, Clay, Glass and Related Materials
68	Textile Occupations
69	Machine Trades Occupations, n.e.c.*

In the example, the second digit (5) thus locates the occupation in the "Printing Occupations" division.

The third digit defines the occupational group within the division. The groups within the "Printing Occupations" division are as follows:

650	Typesetters and Composers
651	Printing Press Occupations
652	Printing Machine Occupations
653	Bookbinding-Machine Operators and Related Occupations
654	Typecasters and Related Occupations
659	Printing Occupations, n.e.c.

The third digit in the example (2) locates the occupation in the "Printing Machine Occupations" group.

---

*Some divisions or groups end in the designation "n.e.c." (not elsewhere classified). This indicates that the occupations do not logically fit into more precisely defined divisions or groups, or that they could fit into two or more of them equally well.

The *middle three digits* of the DOT occupational code are the worker functions ratings of the tasks performed in the occupation. Every job requires a worker to function to some degree in relation to data, people, and things. A separate digit expresses the worker's relationship to each of these three groups:

DATA (4th Digit)	*PEOPLE* (5th Digit)	*THINGS* (6th Digit)
0 Synthesizing	0 Mentoring	0 Setting Up
1 Coordinating	1 Negotiating	1 Precision Working
2 Analyzing	2 Instructing	2 Operating-Controlling
3 Compiling	3 Supervising	3 Driving-Operating
4 Computing	4 Diverting	4 Manipulating
5 Copying	5 Persuading	5 Tending
6 Comparing	6 Speaking-Signalling	6 Feeding-Offbearing
	7 Serving	7 Handling
	8 Taking Instructions-Helping	

Worker functions involving more complex responsibility and judgment are assigned lower numbers in these three lists while functions which are less complicated have higher numbers. For example, "synthesizing" and "coordinating" data are more complex tasks than "copying" data; "instructing" people involves a broader responsibility than "taking instructions-helping"; and "operating" things is a more complicated task than "handling" things.

The worker functions code in the example (382) relates to the middle three digits of the DOT occupational code and has a different meaning and no necessary connection with group code 652 (first three digits).

The worker functions [4] code (382) may relate to any occupational group. It signifies that the worker is "compiling" in relation to data (3); "taking instructions-helping" in relation to people (8); and "operating-controlling" in relation to things (2). The worker functions code indicates the broadest level of responsibility or judgment required in relation to data, people, or things. It is assumed that, if the job requires it, the worker can generally perform any higher numbered function listed in each of the three categories.

The *last three digits* of the occupational code number indicate the alphabetical order of titles within 6-digit code groups. They serve to differentiate a particular occupation from all others. A number of occupations may have the same first six digits, but no two can have the same nine digits. If a 6-digit code is applicable to only one occupational title, the final three digits assigned are always 010 (as in the example). If there is more than one occupation with the same first six digits, the final three digits are usually assigned in alphabetical order of titles in multiples of four (010, 014, 018, 022, etc.). If another printing machine occupation had the same six digits as CLOTH PRINTER (any ind.), and began with the letter "D," it would be assigned the occupational code 652.382-014.

---

[4] See appendix J-K for more detailed discussion of worker functions codes.

The full nine digits thus provide each occupation with a unique code suitable for computerized operations.

(2) The Occupational Title

Immediately following the occupational code in every definition is the occupational base title. The base title is always in upper-case boldface letters. It is the most common type of title found in the DOT, and is the title by which the occupation is known in the majority of establishments in which it was found. In the example, CLOTH PRINTER (any ind.) is a base title.

Some titles are classified as *master titles*. These titles are designed to eliminate unnecessary repetition of tasks common to a large number of occupations. Master titles define the common job tasks having a wide variety of job variables and a wide variety of titles. An example is the title "SUPERVISOR (any ind.)." Each individual supervisory occupation has its own separate definition in the DOT describing its unique duties, but at the end of the definition the reader is referred back to the master definition (in this case, by a sentence reading "Performs other duties as described under SUPERVISOR (any ind.)." By referring to this master definition, the user will learn about the typical supervisory duties which any individual supervisor also performs.

Another type of DOT title is a *term title*. These include occupations with the same title but few common duties. An example of a term definition is:

> CONSULTING ENGINEER (profess. & kin.): A term applied to workers who consult with and advise clients on specialized engineering matters in a particular field of endeavor, such as chemical engineering, civil engineering, or mechanical engineering.

Since neither master nor term definitions are occupations, they are not coded in the occupational group arrangement but are found in separate sections of the DOT (see Contents).

There are other major types of titles used in the DOT, including *alternate titles* and *undefined related titles*. These are discussed later in this subsection of the Introduction.

(3) Industry Designation

The industry designation is in parentheses immediately following the occupational base title. It often differentiates between two or more occupations with identical titles but different duties. Because of this, it is an integral and inseparable part of any occupational title. An industry designation often tells one or more things about an occupation such as:

-location of the occupation (hotel & rest.; mach. shop)
-types of duties associated with the occupation (clean., dye. & press.; education)
-products manufactured (textile; optical goods)
-processes used (electroplating; petrol. refin.)
-raw materials used (nonfer. metal alloys; stonework)

While a definition usually receives the designation of the industry or industries in which it occurs, certain occupations occur in a large number of industries. When this happens, the industry is assigned a cross-industry designation. For example, clerical occupations are found in almost every industry. To show the broad, cross-industry nature of clerical occupations, "clerical" is an industry designation in itself. Among other cross-industry designations are: "profess. & kin.," "mach. shop," and "woodworking."

Occupations which occur in a number of industries, but are not found so widely as to warrant their own industry designation, are given the designation of "any industry." The job title in the example is given this designation. It should always be given as CLOTH PRINTER (any ind.).

(4) Alternate Titles

An alternate title is a synonym for the base title. It is not as commonly used as the base title. Alternate titles are shown in lower-case boldface letters immediately after the base title and its industrial designation. In our example, two alternate titles are given: "printer" and "printing-machine operator." Alternate titles may not be used by public employment service offices in assigning occupational classifications. Alternate titles are cross-referenced to their base titles in the Alphabetical Index of Occupational Titles (p. 965). A particular occupation may have a large number of alternate titles or none at all. Alternate titles carry the code numbers and industry designations of the base title.

(5) The Body of the Definition

The body of the definition usually consists of two or three main parts: a lead statement, a number of task element statements, and a third part known as a "may" item.

(a) The Lead Statement

The first sentence following the industry designation and alternate titles (if any) is the lead statement. It is followed by a colon (:). The lead statement summarizes the entire occupation. It offers essential information such as:

- worker actions
- the objective or purpose of the worker actions
- machines, tools, equipment, or work aids used by the worker
- materials used, products made, subject matter dealt with, or services rendered
- instructions followed or judgments made

In the example, the sentence "Sets up and operates machine to print designs on materials such as cloth, fiberglass, plastics sheeting, coated felt, or oilcloth:" is the lead statement. From it, the user can obtain an overview of the occupation.

(b) Task Element Statements

Task element statements indicate the specific tasks the worker performs to accomplish the overall job purpose described in the lead statement. The sentences in the example beginning with "Turns handwheel. . .", "Turns screws . . .", "Sharpens doctor . . .", "Alines doctor . . .", "Dips color . . .", etc. are all task element statements. They indicate how the worker actually carries out his or her duties.

(c) "May" Items

Many definitions contain one or more sentences beginning with the word "May." They describe duties required of workers in this occupation in some establishments but not in others. The word "May" does *not* indicate that a worker will sometimes perform this task but rather that some workers in different establishments generally perform one of the varied tasks listed. In the example, the three sentences beginning "May notify . . .", "May mount . . .", "May position . . .", are "May" items.

The definition also contains a number of additional information elements designed to assist the user. Among these elements are:

Italicized words: Any words in a definition shown in italics are defined in the "Glossary" (p. 947). They are technical terms or special uses of terms not ordinarily found in a standard dictionary (in the example, the words "printing rollers," "doctor," and "blanket" are italicized. Their precise meaning can be found in the "Glossary").

Bracketed titles: A bracketed title indicates that the worker in the base title occupation performs some duties of the bracketed occupation as a part of his regular duties. In the example, the CLOTH PRINTER (any ind.) "May mount printing rollers . . . ." Since this task is usually performed by a PRINTER-ROLLER HANDLER (textile), this occupation is bracketed. To learn more about this particular aspect of the occupation, the user can look up the bracketed occupational title.

Unbracketed titles: Unbracketed titles are used for occupations whose workers have a frequent working relationship with workers in the occupation being defined. In the example, the CLOTH PRINTER (any ind.) may have a close working relationship with a COLORIST (profess. & kin.). This unbracketed title is therefore included in the definition.

Roman numerals: Several somewhat different occupations with the same job title may be found in the same industry. In this event, a Roman numeral follows each title and industry designation. For example, there are three titles in the DOT listed as ASSEMBLER (firearms). In order to distinguish between them, a Roman numeral is assigned to each one (ASSEMBLER (firearms) I, ASSEMBLER (firearms) II, etc.). There is no necessary connection in the sequence of these numbers with the level of complexity of these occupations or the frequency with which they occur in the U.S. economy.

Statement of significant variables: Another element found in some definitions is a statement of significant variables. It appears near the end of a definition and shows the possible variations in jobs that a particular definition can cover. This eliminates the need to include a large number of almost identical definitions in the DOT. The statement begins with "Important variations include. . . ." There is no statement of significant variables in the definition of CLOTH PRINTER (any ind.).

(6) Undefined Related Titles

Undefined related titles, if applicable, appear at the end of the occupational definition, in all capital letters, preceded by the phrase, "May be designated according to. . ." (or a similar phase). In the example, three undefined related titles, are given: NOVELTY-PRINTING-MACHINE-OPERATOR (textile), PROOFING-MACHINE OPERATOR (print. & pub.), and PLISSE-MACHINE OPERATOR (textile). This type of title is for an occupation that is really a variation or specialization of the base occupation. It resembles the base enough to accompany it, but differs from it enough to require an explanatory phrase and its own unique title. An undefined related title takes the same code as its base title. Undefined related titles found in occupational definitions are also listed in the Alphabetical Index of Occupational Titles with their industry designation and the 9-digit codes of their base titles. In addition, they appear in the list of Occupational Titles Arranged by Industry Designation in alphabetical order with 9-digit base title codes, within the appropriate industry.

APPENDIX J

Explanation of Data, People and Things

Much of the information in this publication is based on the premise that every job requires a worker to function in some degree to Data, People and Things. These relationships are identified and explained below. They appear in the form of three listings arranged in each instance from the relatively simple to the complex in such a manner that each successive relationship includes those that are simpler and excludes the more complex. The identifications attached to these relationships are referred to as worker functions, and provide standard terminology for use in summarizing exactly what a worker does on the job.

A job's relationship to Data, People and Things can be expressed in terms of the lowest numbered function in each sequence. These functions taken together indicate the total level of complexity at which the worker performs. The fourth, fifth and sixth digits of the occupational code numbers reflect relationships to Data, People and Things, respectively. These digits express a job's relationship to Data, People and Things by identifying the highest appropriate function in each listing as reflected by the following table:

DATA (4th digit)	PEOPLE (5th digit)	THINGS (6th digit)
0 Synthesizing	0 Mentoring	0 Setting-Up
1 Coordinating	1 Negotiating	1 Precision Working
2 Analyzing	2 Instructing	2 Operating-Controlling
3 Compiling	3 Supervising	3 Driving-Operating
4 Computing	4 Diverting	4 Manipulating
5 Copying	5 Persuading	5 Tending
6 Comparing	6 Speaking-Signaling	6 Feeding - Offbearing
	7 Serving	7 Handling
	8 Taking Instructions - Helping	

Definitions of Worker Functions

DATA: Information, knowledge, and conceptions, related to data, people, or things, obtained by observation, investigation, interpretation, visualization, and mental creation. Data are intangible and include numbers, words, symbols, ideas, concepts, and oral verbalization.

0 Synthesizing: Integrating analyses of data to discover facts and/or develop knowledge concepts or interpretations.

1 Coordinating: Determining time, place, and sequence of operations or action to be taken on the basis of analysis of data; executing determination and/or reporting on events.

2 Analyzing: Examining and evaluating data. Presenting alternative actions in relation to the evaluation is frequently involved.

---

*DICTIONARY OF OCCUPATIONAL TITLES, Ibid., 1977, pp. 1369-1371.

3. Compiling: Gathering, collating, or classifying information about data, people, or things. Reporting and/or carrying out a prescribed action in relation to the information is frequently involved.

4 Computing: Performing arithmetic operations and reporting on and/or carrying out a prescribed action in relation to them. Does not include counting.

5 Copying: Transcribing, entering, or posting data.

6 Comparing: Judging the readily observable functional, structural, or compositional characteristics (whether similar to or divergent from obvious standards) of data, people, or things.

PEOPLE: Human beings; also animals dealt with on an individual basis as if they were human.

0 Mentoring: Dealing with individuals in terms of their total personality in order to advise, counsel, and/or guide them with regard to problems that may be resolved by legal, scientific, clinical, spiritual, and/or other professional principles.

1 Negotiating: Exchanging ideas, information, and opinions with others to formulate policies and programs and/or arrive jointly at decisions, conclusions, or solutions.

2 Instructing: Teaching subject matter to others, or training others (including animals) through explanation, demonstration, and supervised practice; or making recommendations on the basis of technical disciplines.

3. Supervising: Determining or interpreting work procedures for a group of workers, assigning specific duties to them, maintaining harmonious relations among them, and promoting efficiency. A variety of responsibilities is involved in this function.

4 Diverting: Amusing others. (Usually accomplished through the medium of stage, screen, television, or radio.)

5 Persuading: Influencing others in favor of a product, service, or point of view.

6 Speaking-Signaling: Talking with and/or signaling people to convey or exchange information. Includes giving assignments and/or directions to helpers or assistants.

7 Serving: Attending to the needs or requests of people or animals or the expressed or implicit wishes of people. Immediate response is involved.

8 Taking Instructions-Helping: Helping applies to "non-learning" helpers. No variety of responsibility is involved in this function.

THINGS: Inanimate objects as distinguished from human beings, substances or materials; machines, tools, equipment and products. A thing is tangible and has shape, form, and other physical characteristics.

0 Setting up: Adjusting machines or equipment by replacing or altering tools, jigs, fixtures, and attachments to prepare them to perform their functions, change their performance, or restore their proper functioning if they break down. Workers who set up one or a number of machines for other workers or who set up and personally operate a variety of machines are included here.

1 Precision Working: Using body members and/or tools or work aids to work, move, guide, or place objects or materials in situations where ultimate responsibility for the attainment of standards occurs and selection of appropriate tools, objects, or materials, and the adjustment of the tool to the task require exercise of considerable judgment.

2 Operating-Controlling: Starting, stopping, controlling, and adjusting the progress of machines or equipment. Operating machines involves setting up and adjusting the machine or material(s) as the work progresses. Controlling involves observing gages, dials, etc., and turning valves and other devices to regulate factors such as temperature, pressure, flow of liquids, speed of pumps, and reactions of materials.

3 Driving-Operating: Starting, stopping, and controlling the actions of machines or equipment for which a course must be steered, or which must be guided, in order to fabricate, process, and/or move things or people. Involves such activities as observing gages and dials; estimating distances and determining speed and direction of other objects; turning cranks and wheels; pushing or pulling gear lifts or levers. Includes such machines as cranes, conveyor systems, tractors, furnace charging machines, paving machines and hoisting machines. Excludes manually powered machines, such as handtrucks and dollies, and power assisted machines, such as electric wheelbarrows and handtrucks.

4 Manipulating: Using body members, tools, or special devices to work, move, guide, or place objects or materials. Involves some latitude for judgment with regard to precision attained and selecting appropriate tool, object, or material, although this is readily manifest.

5 Tending: Starting, stopping, and observing the functioning of machines and equipment. Involves adjusting materials or controls of the machine, such as changing guides, adjusting timers and temperature gages, turning valves to allow flow of materials, and flipping switches in response to lights. Little judgment is involved in making these adjustments.

6 Feeding-Offbearing: Inserting, throwing, dumping, or placing materials in or removing them from machines or equipment which are automatic or tended or operated by other workers.

7 Handling: Using body members, handtools, and/or special devices to work, move or carry objects or materials. Involves little or no latitude for judgment with regard to attainment of standards or in selecting appropriate tool, object, or material.

APPENDIX K

EXPLANATION OF WORKER TRAITS COMPONENTS*

II. APTITUDES

Specific capacities and abilities required of an individual in order to learn or perform adequately a task or job duty.

- *G* INTELLIGENCE: General learning ability. The ability to "catch on" or understand instructions and underlying principles. Ability to reason and make judgments. Closely related to doing well in school.
- *V* VERBAL: Ability to understand meanings of words and ideas associated with them, and to use them effectively. To comprehend language, to understand relationships between words, and to understand meanings of whole sentences and paragraphs. To present information or ideas clearly.
- *N* NUMERICAL: Ability to perform arithmetic operations quickly and accurately.
- *S* SPATIAL: Ability to comprehend forms in space and understand relationships of plane and solid objects. May be used in such tasks as blueprint reading and in solving geometry problems. Frequently described as the ability to "visualize" objects of two or three dimensions, or to think visually of geometric forms.
- *P* FORM PERCEPTION: Ability to perceive pertinent detail in objects or in pictorial or graphic material; To make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.
- *Q* CLERICAL PERCEPTION: Ability to perceive pertinent detail in verbal or tabular material. To observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation.
- *K* MOTOR COORDINATION: Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. Ability to make a movement response accurately and quickly.
- *F* FINGER DEXTERITY: Ability to move the fingers and manipulate small objects with the fingers rapidly or accurately.
- *M* MANAUL DEXTERITY: Ability to move the hands easily and skillfully. To work with the hands in placing and turning motions.
- *E* EYE-HAND-FOOT COORDINATION: Ability to move the hand and foot coordinately with each other in accordance with visual stimuli.
- *C* COLOR DISCRIMINATION: Ability to perceive or recognize similarities or differences in colors, or in shades or other values of the same color; to identify a particular color, or to recognize harmonious or contrasting color combinations, or to match colors accurately.

Explanation of Levels

The digits indicate how much of each aptitude the job requires for satisfactory (average) performance. The average requirements, rather than maximum or minimum, are cited. The amount required is expressed in terms of equivalent amounts possessed by segments of the general working population.

The following scale is used:

- *1* The top 10 percent of the population. This segment of the population possesses an extremely high degree of the aptitude.
- *2* The highest third exclusive of the top 10 percent of the population. This segment of the population possesses an above average or high degree of the aptitude.
- *3* The middle third of the population. This segment of the population possesses a medium degree of the aptitude, ranging from slightly below to slightly above average.
- *4* The lowest third exclusive of the bottom 10 percent of the population. This segment of the population possesses a below average or low degree of the aptitude.
- *5* The lowest 10 percent of the population. This segment of the population possesses a negligible degree of the aptitude.

---

*U. S. Department of Labor, Manpower Administration. DICTIONARY OF OCCUPATIONAL TITLES, Volume II: OCCUPATIONAL CLASSIFICATION, 3rd Edition. Washington, D. C.: U. S. Government Printing Office, 1965, pp. 649-656.

III. INTERESTS

Preferences for certain types of work activities or experiences, with accompanying rejection of contrary types of activities or experiences. Five pairs of interest factors are provided so that a positive preference for one factor of a pair also implies rejection of the other factor of that pair.

1	Situations involving a preference for activities dealing with things and objects.	vs.	*6*	Situations involving a preference for activities concerned with people and the communication of ideas.
2	Situations involving a preference for activities involving business contact with people.	vs.	*7*	Situations involving a preference for activities of a scientific and technical nature.
3	Situations involving a preference for activities of a routine, concrete, organized nature.	vs.	*8*	Situations involving a preference for activities of an abstract and creative nature.
4	Situations involving a preference for working for people for their presumed good, as in the social welfare sense, or for dealing with people and language in social situations.	vs.	*9*	Situations involving a preference for activities that are nonsocial in nature, and are carried on in relation to processes, machines, and techniques.
5	Situations involving a preference for activities resulting in prestige or the esteem of others.	vs.	*0*	Situations involving a preference for activities resulting in tangible, productive satisfaction.

IV. TEMPERAMENTS

Different types of occupational situations to which workers must adjust.

1 Situations involving a variety of duties often characterized by frequent change.
2 Situations involving repetitive or short cycle operations carried out according to set procedures or sequences.
3 Situations involving doing things only under specific instruction, allowing little or no room for independent action or judgment in working out job problems.
4 Situations involving the direction, control, and planning of an entire activity or the activities of others.
5 Situations involving the necessity of dealing with people in actual job duties beyond giving and receiving instructions.
6 Situations involving working alone and apart in physical isolation from others, although the activity may be integrated with that of others.
7 Situations involving influencing people in their opinions, attitudes, or judgments about ideas or things.
8 Situations involving performing adequately under stress when confronted with the critical or unexpected or when taking risks.
9 Situations involving the evaluation (arriving at generalizations, judgments, or decisions) of information against sensory or judgmental criteria.
0 Situations involving the evaluation (arriving at generalizations, judgments, or decisions) of information against measurable or verifiable criteria.
X Situations involving the interpretation of feelings, ideas, or facts in terms of personal viewpoint.
Y Situations involving the precise attainment of set limits, tolerances, or standards.

V. PHYSICAL DEMANDS

Physical demands are those physical activities required of a worker in a job.

The physical demands referred to in this Dictionary serve as a means of expressing both the physical requirements of the job and the physical capacities (specific physical traits) a worker must have to meet the requirements. For example, "seeing" is the name of a physical demand required by many jobs (perceiving by the sense of vision), and also the name of a specific capacity possessed by many people (having the power of sight). The worker must possess physical capacities at least in an amount equal to the physical demands made by the job.

The Factors

1 **Lifting, Carrying, Pushing, and/or Pulling (Strength).** These are the primary "strength" physical requirements, and generally speaking, a person who engages in one of these activities can engage in all.

Specifically, each of these activities can be described as:

(1) Lifting: Raising or lowering an object from one level to another (includes upward pulling).
(2) Carrying: Transporting an object, usually holding it in the hands or arms or on the shoulder.
(3) Pushing: Exerting force upon an object so that the object moves away from the force (includes slapping, striking, kicking, and treadle actions).
(4) Pulling: Exerting force upon an object so that the object moves toward the force (includes jerking).

The five degrees of Physical Demands Factor No. 1 (Lifting, Carrying, Pushing, and/or Pulling), are as follows:

S Sedentary Work

Lifting 10 lbs. maximum and occasionally lifting and/or carrying such articles as dockets, ledgers, and small tools. Although a sedentary job is defined as one which involves sitting, a certain amount of walking and standing is often necessary in carrying out job duties. Jobs are sedentary if walking and standing are required only occasionally and other sedentary criteria are met.

L Light Work

Lifting 20 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 10 lbs. Even though the weight lifted may be only a negligible amount, a job is in this category when it requires walking or standing to a significant degree, or when it involves sitting most of the time with a degree of pushing and pulling of arm and/or leg controls.

M Medium Work

Lifting 50 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 25 lbs.

H Heavy Work

Lifting 100 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 50 lbs.

V Very Heavy Work

Lifting objects in excess of 100 lbs. with frequent lifting and/or carrying of objects weighing 50 lbs. or more.

2 **Climbing and/or Balancing:**

(1) Climbing: Ascending or descending ladders, stairs, scaffolding, ramps, poles, ropes, and the like, using the feet and legs and/or hands and arms.

(2) Balancing: Maintaining body equilibrium to prevent falling when walking, standing, crouching, or running on narrow, slippery, or erratically moving surfaces; or maintaining body equilibrium when performing gymnastic feats.

3 **Stooping, Kneeling, Crouching, and/or Crawling:**

(1) Stooping: Bending the body downward and forward by bending the spine at the waist.
(2) Kneeling: Bending the legs at the knees to come to rest on the knee or knees.
(3) Crouching: Bending the body downward and forward by bending the legs and spine.
(4) Crawling: Moving about on the hands and knees or hands and feet.

4 **Reaching, Handling, Fingering, and/or Feeling:**

(1) Reaching: Extending the hands and arms in any direction.
(2) Handling: Seizing, holding, grasping, turning, or otherwise working with the hand or hands (fingering not involved).
(3) Fingering: Picking, pinching, or otherwise working with the fingers primarily (rather than with the whole hand or arm as in handling).
(4) Feeling: Perceiving such attributes of objects and materials as size, shape, temperature, or texture, by means of receptors in the skin, particularly those of the finger tips.

5 **Talking and/or Hearing:**

(1) Talking: Expressing or exchanging ideas by means of the spoken word.
(2) Hearing: Perceiving the nature of sounds by the ear.

6 **Seeing:**

Obtaining impressions through the eyes of the shape, size, distance, motion, color, or other characteristics of objects. The major visual functions are: (1) acuity, far and near, (2) depth perception, (3) field of vision, (4) accommodation, (5) color vision. The functions are defined as follows:

(1) Acuity, far—clarity of vision at 20 feet or more.
Acuity, near—clarity of vision at 20 inches or less.
(2) Depth perception—three dimensional vision. The ability to judge distance and space relationships so as to see objects where and as they actually are.
(3) Field of vision—the area that can be seen up and down or to the right or left while the eyes are fixed on a given point.
(4) Accommodation—adjustment of the lens of the eye to bring an object into sharp focus. This item is especially important when doing near-point work at varying distances from the eye.
(5) Color vision—the ability to identify and distinguish colors.

VI. WORKING CONDITIONS

Working conditions are the physical surroundings of a worker in a specific job.

1 Inside, Outside, or Both:

I Inside: Protection from weather conditions but not necessarily from temperature changes.
O Outside: No effective protection from weather.
B Both: Inside and outside.

A job is considered "inside" if the worker spends approximately 75 per cent or more of his time inside, and "outside" if he spends approximately 75 per cent or more of his time outside. A job is considered "both" if the activities occur inside or outside in approximately equal amounts.

2 Extremes of Cold Plus Temperature Changes:

(1) Extremes of Cold: Temperature sufficiently low to cause marked bodily discomfort unless the worker is provided with exceptional protection.

(2) Temperature Changes: Variations in temperature which are sufficiently marked and abrupt to cause noticeable bodily reactions.

3 Extremes of Heat Plus Temperature Changes:

(1) Extremes of Heat: Temperature sufficiently high to cause marked bodily discomfort unless the worker is provided with exceptional protection.

(2) Temperature Changes: Same as 2 (2).

4 Wet and Humid:

(1) Wet: Contact with water or other liquids.

(2) Humid: Atmospheric condition with moisture content sufficiently high to cause marked bodily discomfort.

5 Noise and Vibration:

Sufficient noise, either constant or intermittent, to cause marked distraction or possible injury to the sense of hearing and/or sufficient vibration (production of an oscillating movement or strain on the body or its extremities from repeated motion or shock) to cause bodily harm if endured day after day.

6 Hazards:

Situations in which the individual is exposed to the definite risk of bodily injury.

7 Fumes, Odors, Toxic Conditions, Dust, and Poor Ventilation:

(1) Fumes: Smoky or vaporous exhalations, usually odorous, thrown off as the result of combustion or chemical reaction.

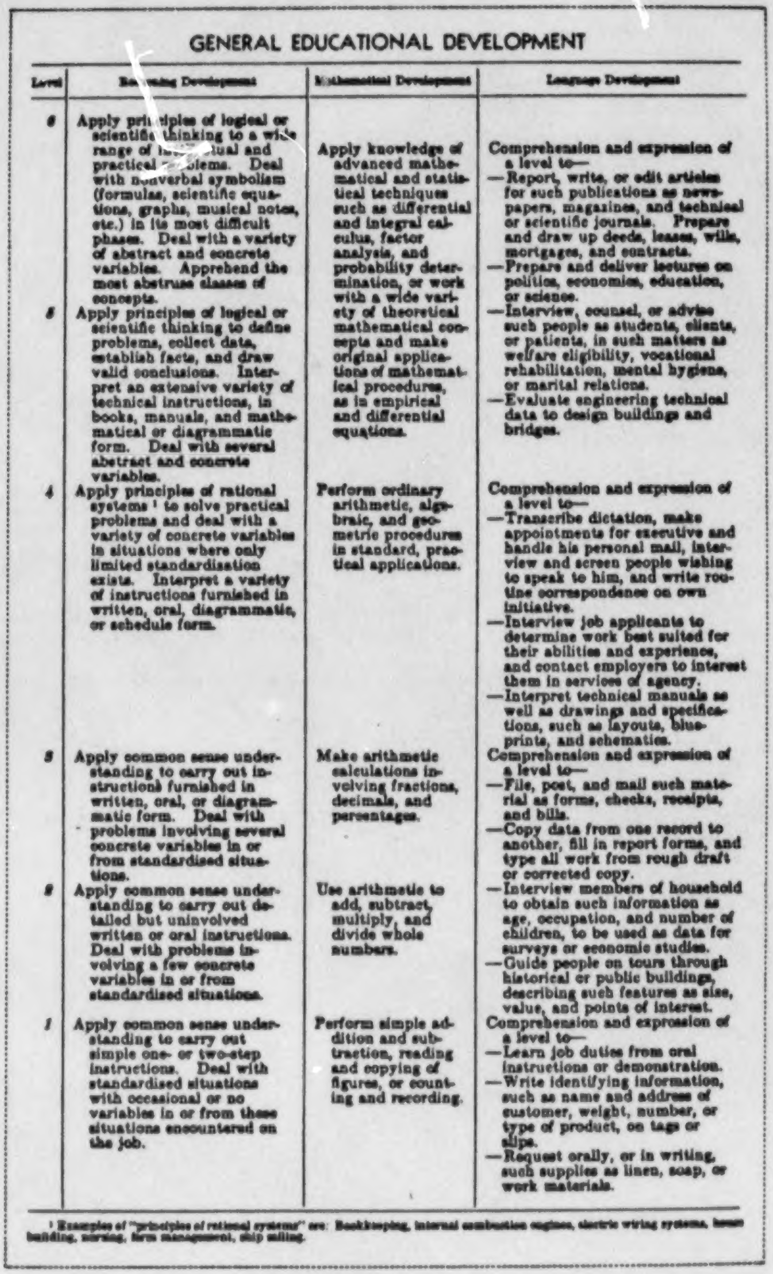
(2) Odors: Noxious smells, either toxic or nontoxic.

(3) Toxic Conditions: Exposure to toxic dust, fumes, gases, vapors, mists, or liquids which cause general or localized disabling conditions as a result of inhalation or action on the skin.

(4) Dust: Air filled with small particles of any kind, such as textile dust, flour, wood, leather, feathers, etc., and inorganic dust, including silica and asbestos, which make the workplace unpleasant or are the source of occupational diseases.

(5) Poor Ventilation: Insufficient movement of air causing a feeling of suffocation; or exposure to drafts.

APPENDIX L



GENERAL EDUCATIONAL DEVELOPMENT

Level	Reasoning Development	Mathematical Development	Language Development
6	Apply principles of logical or scientific thinking to a wide range of intellectual and practical problems. Deal with nonverbal symbolism (formulas, scientific equations, graphs, musical notes, etc.) in its most difficult phases. Deal with a variety of abstract and concrete variables. Apprehend the most abstruse classes of concepts.	Apply knowledge of advanced mathematical and statistical techniques such as differential and integral calculus, factor analysis, and probability determination, or work with a wide variety of theoretical mathematical concepts and make original applications of mathematical procedures, as in empirical and differential equations.	Comprehension and expression of a level to— —Report, write, or edit articles for such publications as newspapers, magazines, and technical or scientific journals. Prepare and draw up deeds, leases, wills, mortgages, and contracts. —Prepare and deliver lectures on politics, economics, education, or science. —Interview, counsel, or advise such people as students, clients, or patients, in such matters as welfare eligibility, vocational rehabilitation, mental hygiene, or marital relations. —Evaluate engineering technical data to design buildings and bridges.
5	Apply principles of logical or scientific thinking to define problems, collect data, establish facts, and draw valid conclusions. Interpret an extensive variety of technical instructions, in books, manuals, and mathematical or diagrammatic form. Deal with several abstract and concrete variables.		
4	Apply principles of rational systems[1] to solve practical problems and deal with a variety of concrete variables in situations where only limited standardization exists. Interpret a variety of instructions furnished in written, oral, diagrammatic, or schedule form.	Perform ordinary arithmetic, algebraic, and geometric procedures in standard, practical applications.	Comprehension and expression of a level to— —Transcribe dictation, make appointments for executive and handle his personal mail, interview and screen people wishing to speak to him, and write routine correspondence on own initiative. —Interview job applicants to determine work best suited for their abilities and experience, and contact employers to interest them in services of agency. —Interpret technical manuals as well as drawings and specifications, such as layouts, blueprints, and schematics.
3	Apply common sense understanding to carry out instructions furnished in written, oral, or diagrammatic form. Deal with problems involving several concrete variables in or from standardized situations.	Make arithmetic calculations involving fractions, decimals, and percentages.	Comprehension and expression of a level to— —File, post, and mail such material as forms, checks, receipts, and bills. —Copy data from one record to another, fill in report forms, and type all work from rough draft or corrected copy. —Interview members of household to obtain such information as age, occupation, and number of children, to be used as data for surveys or economic studies. —Guide people on tours through historical or public buildings, describing such features as size, value, and points of interest.
2	Apply common sense understanding to carry out detailed but uninvolved written or oral instructions. Deal with problems involving a few concrete variables in or from standardized situations.	Use arithmetic to add, subtract, multiply, and divide whole numbers.	
1	Apply common sense understanding to carry out simple one- or two-step instructions. Deal with standardized situations with occasional or no variables in or from these situations encountered on the job.	Perform simple addition and subtraction, reading and copying of figures, or counting and recording.	Comprehension and expression of a level to— —Learn job duties from oral instructions or demonstration. —Write identifying information, such as name and address of customer, weight, number, or type of product, on tags or slips. —Request orally, or in writing, such supplies as linen, soap, or work materials.

---

[1] Examples of "principles of rational systems" are: Bookkeeping, internal combustion engines, electric wiring systems, house building, nursing, farm management, ship sailing.

U. S. Department of Labor, Manpower Administration. A SUPPLEMENT TO THE DICTIONARY OF OCCUPATIONAL TITLES, 3rd Edition. U. S. Government Printing Office, Washington, D. C., 1966, p. A-6.